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ARAB MEDICINE
& SURGERY



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GENERAL PRACTITIONERS OF THE AURES

b



HAMLET CONTAINING A 'HOSPITAL'

ARAB MEDICINE
& SURGERY

*A Study of the
Healing Art in Algeria*

BY

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LONDON
OXFORD UNIVERSITY PRESS
HUMPHREY MILFORD

1922

TA 4

ALGERIA: Arabian Medicine

ARABIAN MEDICINE: Algeria

BUC. 134(2)

PRINTED IN ENGLAND

AT THE OXFORD UNIVERSITY PRESS



P R E F A C E

IT is with the greatest diffidence that I lay this little work before students of the History of Surgery, Medicine, and Pharmacology.

A layman—totally untrained in medical science—I suddenly found myself in 1913 admitted to some of the secrets of the reticent Berber and Arab doctors of the Aures Massif, Algeria.

It is my misfortune that I lacked the knowledge necessary to enable me to do justice to the opportunities of studying their art which I have enjoyed.

But for the kindly interest taken in my work by the late Sir William Osler I should not have ventured to publish these notes at all.

In the circumstances all that I can attempt in the following pages is to describe as I have seen it the life and work of the practitioners of the remote valleys of the Aures Mountains and, when dealing with their operations and methods of treatment, to act as the mouthpiece of the native doctors themselves.

I wish to offer my heartiest thanks to the authorities at the Herbarium at Kew and at the Botanical Gardens, Oxford: to Professor E. B. Poulton and Mr. E. W. Holmes, for the care with which they have determined for me the *materia medica* I have collected. To the Council of the Royal Society of Medicine and of the Royal Anthropological Institute for allowing me to reproduce, in a form amplified as a result of later inquiries in the field, material which I have already dealt with in

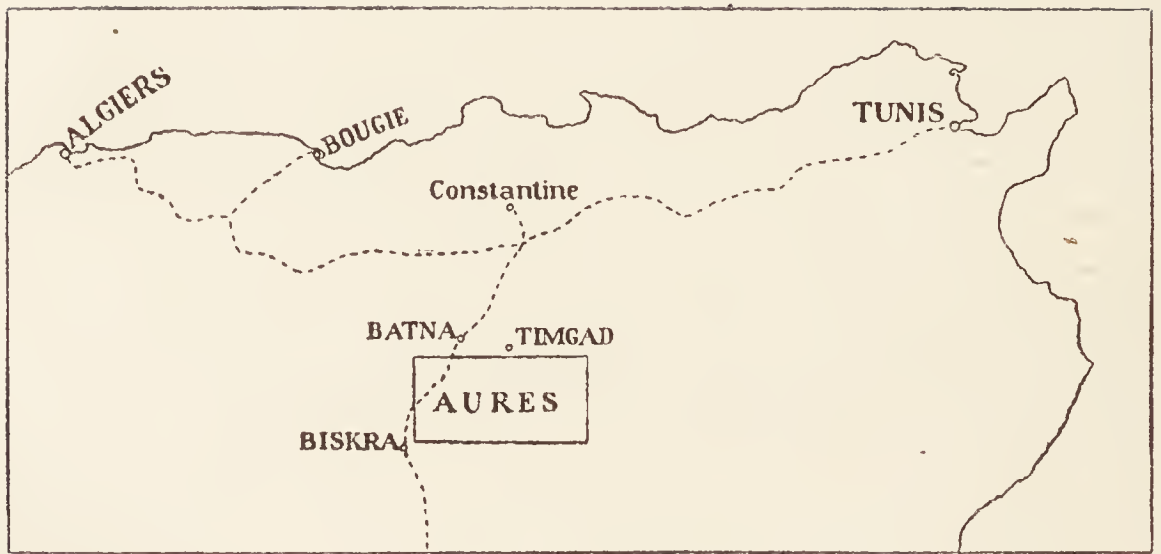
their Proceedings and Journal: the Council of the former Society having kindly permitted me to use again the photograph of a splint (Pl. VI, *b*) which appeared in the *Proceedings of the Royal Society of Medicine*, 1920, vol. xiii: and to Professor J. A. Gunn and Dr. Charles Singer for much advice and kindly criticism. To Mr. Henry Balfour, Curator of the Pitt-Rivers Museum, Oxford, I am indebted not merely for permission to publish many illustrations of instruments now in that Museum, but also for his never-failing encouragement, without which I should probably never have commenced the, to me, fascinating study of Shawiya ethnography at all. Finally, to the French Government, and to all its officers and officials with whom I have come into contact in Algeria, I desire to express my deep sense of gratitude for all the facilities, kindness, and hospitality which my wife and I have ever received at their hands.

M. W. HILTON-SIMPSON.

OXFORD, 1922.

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INTRODUCTION

WHEN in 1912 my wife and I selected the Aures massif on the fringe of the great Sahara, to the north-east of the modern tourist resort and French garrison town of Biskra, as a field in which to attempt an ethnographical survey of a branch of the ancient Berber stock, we were guided in our choice by the geography of the region. We thought that in a natural fortress such as the Aures, protected from invasion by precipitous walls of rock on every side and subdivided by a series of ridges into a number of secluded and wellnigh inaccessible valleys, we might reasonably hope to find among its Shawiya Berber inhabitants relics of the past in the shape of arts, crafts, and customs which have long disappeared from the more accessible regions of Barbary before the advance of the successive waves of conquest which have swept over North Africa since the dawn of history.

In this we were not disappointed. Despite the propinquity of the civilization of Rome in the great camp of Lambessa, built upon the plateau to the north of the massif to protect the Roman farmers from the warlike excursions of the mountaineers, and its neighbour, the fair city of Timgad, which sprang into being as a result of Roman prosperity; despite the Arab conquest and occupation of the surrounding country, we found that among the Shawiya, a race ethnically distinct from the peoples of the desert, speaking a dialect of the ancient Berber language, and scarcely contaminated by an infusion of Arab blood, we could observe arts, such as the wheel-less manufacture of a very archaic type of pottery, which have persisted unchanged throughout countless centuries, and distinct traces of ancient ceremonies and rites which appear to have undergone little modification since they

were described by Herodotus in neighbouring districts of Libya.¹

Nevertheless the conservative Shawiya have in the past adopted certain of the arts of their more civilized neighbours, and have preserved them unaltered down to the present day. Examples of these, which I have described elsewhere, are to be found in an oil-press,² a clepsydra or water-clock,³ and a corn-mill driven by a horizontal water-wheel.⁴

Later, after a bitter struggle, the faith of Islam, carried so triumphantly by the Arab conqueror over the lower country around the massif in the seventh century of our era, spread to the Berber peoples of the hills, absorbing rather than destroying many of their ancient cults, bringing in its wake some of the literature of the Moslem world, and, perhaps most important of all from the point of view of the student of Shawiya medicine, enjoining the pilgrimage to Mecca as a religious duty upon all those of its adepts to whom the undertaking was possible. Thus, though the forbidding frontiers of the Aures have to a great extent excluded from its remote valleys the science and progress of the outer world, some of the more enterprising of the Shawiya Moslems have been brought into contact with the oriental learning of their day in the course of travels to the shrine of their adopted faith, and have doubtless brought back to their mountain homes knowledge of arts of which they themselves would have remained in ignorance but for the pious journeys they had undertaken.

When we commenced our general ethnographical researches in the Aures I had studied a paper by Doctors Malbot and Verneau in *L'Anthropologie*⁵ in which they described the operation of the trepan as being performed among the primitive Berbers of the massif, and I determined to attempt to acquire for the Pitt-Rivers Museum, Oxford, for which we were to form an ethnographical collection,

¹ H.-S.; 'Influence of its Geography on the People of the Aures Massif, Algeria,' *Geographical Journal*, vol. lix, Jan. 1922.

² *Man*, August 1920.

³ *Geographical Journal*, January 1922.

⁴ *Scottish Geographical Magazine*, 1922.

⁵ viii, 1897, p. 174.

some of the instruments used by their surgeons, instruments which, I understood, were not to be found in museums in England, if, indeed, a collection of them existed in any museum at all. Upon making preliminary inquiries among French officials on the spot, however, I was informed that although many living cases of natives bearing the scar of the trepan and other operations are constantly observed by officials (Pl. II), the practice of surgery by persons who do not possess the necessary French qualification is, of course, prohibited by law, and, consequently, the native practitioner, in any case fanatically disinclined to impart information to a Christian stranger, is doubly reticent about his methods and even refuses to admit that he practises medicine and surgery at all. Indeed, one French medical officer whom I consulted assured me that I should never see either a surgeon or an instrument although, he stated, operations were frequently performed in the locality I was about to visit. I was agreeably surprised, therefore, to find that in the course of my general ethnographical work I had made friends with a nomad Arab who was well known as a successful surgeon, and who, when once the nature of his calling had been accidentally disclosed, not only consented to supply me with some details of his art and with a set of about ten instruments used in trepanning, but offered to give me further information if I could return to his tribe in the winter of 1913-14. This my wife and I did, and we found our Arab friend quite ready to keep his promise.

With the help of certain Berber friends made in 1913 I was also able to get into touch with about eight Shawiya practitioners in the Aures massif itself, who, finding that their nomad Arab neighbour had suffered no ill effects from the trust he had placed in me, supplied me with about fifty instruments, a collection of their materia medica, and a good deal of information as to their medicine and surgery.

I soon realized that, at last, the primitive surgery of the Aures was beginning to undergo a change, brought about by the possibility of securing some simple European instruments and drugs in such centres of civilization as Batna and Biskra, and I decided that, unqualified as I was to undertake

serious researches in native medicine and surgery, I should be well advised to profit as far as I could by my good fortune in becoming friendly with so many doctors, a good fortune which would appear not to have been previously enjoyed by a European, and to endeavour to collect as much information as to their methods as was possible for me in the circumstances. I determined, therefore, to undertake a third journey in the Aures in the winter of 1914-15. In August 1914, however, my ethnographical work came abruptly to an end, only to be resumed some five years later.

In the autumn of 1919, having described some of the surgery which I had seen in the Aures before the war to the Historical Section of the Royal Society of Medicine,¹ we returned to Algeria and recommenced our work among the doctors, with some of whom I had communicated by letter during the war. In this journey, and during the winter 1920-1, I obtained more than one hundred instruments and many of the medical notes which, with those brought home in 1913 and 1914, form the material for the final section of this book.

It is, perhaps, noteworthy as an example of the extreme secrecy with which the natives practise the healing art, that I became acquainted after the war with practitioners in three small villages in which I had spent some considerable time in my previous journeys without having been able to discover that doctors resided in them at all.

As the value of all ethnographical information is very largely dependent upon the methods employed by the observer in the field, I may, perhaps, describe exactly how I obtained my information. I invariably travelled, accompanied by my wife, in the simplest manner possible. We were attended by no servants other than the muleteers, who brought their beasts to convey our baggage from village to village when we moved, but we were always accompanied by a French-speaking mounted orderly generously lent to us by the Administration to serve as interpreter and escort. Among the Shawiya we were attended by Shawiya orderlies,

¹ *Proc. Roy. Soc. of Med.*, 1920, vol. xiii, p. 47.

a



b



OPERATIONS ON THE SKULL

c



d



OPERATIONS ON THE ARM AND JAW

among the nomad Arabs by Arabs. These men, though they wore the blue cloak of officialdom, were natives of the areas in which I was working, and in some cases actually relatives of practising doctors, so that the Arab and Shawiya practitioners knew them personally, and did not hesitate to speak before them when once they had been convinced that they had no reason to fear that I should indicate them to the authorities.

When visiting villages we always stayed in the houses of the natives in preference to living in a tent outside the village, believing that in this way we should have ampler opportunities of studying their manners and customs than would be the case if we slept at some distance from them. Occasionally we hired a native's house to live and work in; usually we were the guests of the sheikh or kaïd in charge of the village; sometimes of the doctor with whom we worked.

There are two methods which can be employed when attempting to obtain information from a native doctor; the first is, to work from the disease to the remedy; the second, from the remedy to the disease. I employed both of these according to the inclination of the doctor with whom I was working; but, with regard to medicine, I found the second method to be the more satisfactory. Obviously, in studying surgery, the most practical means of arriving at the instruments used to perform a certain operation (when no genuine case is available for observation) is to assume an injury necessitating such an operation and to induce the surgeon to discuss the treatment he would adopt; but in medicine this scarcely holds good, for I found in practice that often, when I enquired of a doctor how he would treat a given disease, he would prescribe the use of some plant of which he had not a specimen at hand, or which would not at the moment be sufficient for determination by botanists at home, if collected and pressed; in which case I have sometimes been left with the mere native name of a remedy which I have subsequently quite failed to identify. On the other hand, in the majority of the treatments noted, in which I have first obtained specimens of the materia medica and then proceeded

to inquire into their uses, I have been able by the second method to arrive at more definite results.

As far as possible I have always checked the statements of one doctor by questioning others upon the same subjects, and I have been particularly careful to ensure that the plants given to me by native practitioners are really of the species they were supposed to be ; thus, having collected a number of plants from one man, I would pretend, after an interval of several days, and in some cases years, that I had made some mistake in their names and get him to re-name them for me.

In every case the names supplied were those originally told to me, so that I cannot think that any attempt has been made to deceive me in the matter of the plants employed by the Shawiya doctors. The materia medica collected has all been submitted to experts in England, who have kindly examined it and furnished me with the scientific names which I have used.

PART I

THE GENERAL PRACTITIONER OF THE AURES

ALTHOUGH throughout Algeria demons, or 'jenun', are popularly supposed to bring about most of the diseases as well as the mischances which vex the human being, with the result that sorcerers and writers of amulets to counteract magical causes of illness flourish exceedingly, yet the doctors of the Aures, whose work is dealt with in these pages, are men who have definitely studied medicine and surgery. It cannot, therefore, be asserted that among the Shawiya 'la médecine ne se distingue pas encore de la magie', as Professor Edmond Doutté has found to be the case near Marrakesh in Morocco.¹ The studies of all the practitioners with whom I have come into contact had consisted in apprenticeship to an established doctor, almost invariably a member of the young man's own family. In most cases the healing art is handed down from father to son, whole families following the calling of their ancestors; thus in one village I found five brothers engaged in the practice of medicine and surgery, in another three, while in another two cousins are keeping alive the family tradition inaugurated by their great-grandfather, who had studied his art under a famous 'marabout', or member of a saintly family, in Biskra.

It has been suggested by Doctors Malbot and Verneau² that surgery has been studied especially in the region known as the Jebel Shershar on the eastern side of the Aures, and that doctors who had learned their art there were to be found in practice over a wide area of the neighbouring hills and desert. All the practitioners I questioned on the subject, however, denied that this was the case, and stated that doctors were no more numerous in the Jebel Shershar than elsewhere

¹ *En Tribu*, p. 26, 1914.

² *Anthropologie*, vol. viii, p. 176.

and by no means more skilful. One man, however, from the central portion of the Aures massif informed me in 1914 that there are surgeons in the Jebel Shershar who specialize in operations on the head (I met two or three of them in 1920 when I visited their country), and that their art had been handed down to them by 'marabouts' who, in bygone ages, had received divine instruction from angels and had left behind them manuscripts dealing with surgery and medicine; but my informant himself claimed to be more skilful in trepanning than these specialists, a claim which the latter stoutly denied.

This suggestion, that the healing art had formerly been in the hands of maraboutic, or saintly families, is curious, for not one of the practising doctors I have met with belongs to such a family, though the families are very numerous; and I have not heard it suggested that 'marabouts' nowadays have any skill in the healing art other than as experts in charm writing, divining, and medical magic in general.

When I visited the Jebel Shershar I considered it possible that I might find there some 'zawiya', or college, belonging to a maraboutic family in which medicine and surgery is especially studied and from which the students went forth into the country round to carry on the healing art, perhaps equipped with some such form of diploma as Doctor Raynaud found in the possession of a student from Fez in 1893, and of which he gives a translation in his *Étude sur l'hygiène et la médecine au Maroc* (p. 120). In this quest I failed. The practitioners with whom I became acquainted in the Jebel Shershar all denied that any such institution existed, or that they had ever heard of a diploma.

I fully realize the rashness, especially when dealing with a naturally secretive people, of assuming that any given institution or custom does not exist among them merely because I have failed to find any trace of it during my inquiries in the field. But, at the same time, the overwhelming mass of the native opinion which I have been able to obtain tends to show that the healing art is handed down by the oral tradition in families with no maraboutic status; that there is no particular area in the Aures in which it is studied more than in another;

and, although some doctors in the Jebel Shershar undoubtedly specialize in the operation of the trepan, in the same way in which the natives of southern Morocco are stated by the Shawiya to specialize in the treatment of the eye, there is nothing in the evidence I have collected to show that they are more skilful in this or any other operation than their neighbours, or that any existing institution in the Aures has left a particular mark upon medicine or surgery in Algeria.

It seems, then, that the young doctor learns the rudiments of his art while carefully studying the method of some relative who is already established in practice. The great majority of doctors can read Arabic, though I have met with one or two noted practitioners who are quite illiterate. Nearly all of them are in the possession of books, some in manuscript which have been handed down from their fathers, others modern reprints of Arabic authors obtainable in Constantine, Algiers, or, especially, in Tunis.

Although every doctor I questioned regarded the practical instruction given by a doctor to his disciple as being of infinitely greater value than any study of these books, which one of them considered to contain much erroneous information, the books, if of no great value to the student, are used to some extent as works of reference by the practitioner, and I think that they afford us a clue to the origin of the medicine, if not the surgery, of Algeria. The names of the authors whose works I found in most general use among Algerian practitioners are as follows: (1) Suyuti; (2) El Haj Tlemsani; (3) Mohammed ben el Haj el Kebir; (4) Ebn el Beitar; (5) the Imam Suidi; (6) Abi Nasr, known as Cohen el Atthar; (7) Daud el Antaky; and (8) Abderrezzaq, 'the Algerian'. Of these, the first three authors appear to have devoted as much of their work to mere magical practices as to medicine, the work of El Haj Tlemsani being considered so valuable to seekers of hidden treasure, of whom many are said to exist in Morocco to this day, that the mere possession of the book is regarded as wealth in itself, while Suyuti's *Rahma* is one of the works principally referred to by sorcerers in Algeria, though it deals with medicine as well as with magic. The pages of Mohammed ben el Haj el Keber contain a mass of

miscellaneous information in addition to a certain amount of medical lore.

It is to the writings of the remaining five authors, therefore, that the modern practitioner turns in cases which perplex him and to refresh his memory as to the uses of some of his *materia medica*. Ebn el Beitar was, in the opinion of Dr. Lucien Leclerc,¹ the greatest botanist of the East. Born at Malaga in Spain in the last years of the twelfth century, he travelled to the east about A.D. 1220, spending some time in Barbary on the way, during which he noted the use of *Ptychotis verticillata*, as employed in the treatment of leprosy, by a tribe near Bougie on the Algerian coast, and first made known the medicinal uses of *Pyrethrum* at Constantine. His work on *Simples*, which several Shawiya practitioners have told me that they esteem very highly, displays, according to Dr. Leclerc, a great indebtedness to the Greeks, especially to Dioscorides and Galen.

The Imam Suidi, born at Damascus in A.D. 1203, and resident for many years in Syria and Egypt, also refers copiously in his writings to the Greeks, as well as to his contemporary, Ebn el Beitar. Dr. Leclerc found an abridgement of his work on *Simples* at Constantine, as well as two others in Paris. One of the most successful of the Shawiya practitioners I met with informed me that he possessed copies of the two latter, which bear the names of Abd el Wahab and El Sharany as the abbreviators.

Abi Nasr or Cohen el Atthar, a thirteenth-century Jewish pharmacologist of Cairo, is the author of a work on *materia medica* known as *Menhaj Eddukan*, which is much valued by such doctors of the Aures as possess it, and which Dr. Leclerc describes as 'un des plus précieux monuments que la pharmacie arabe nous ait légués'.

Daud el Antaki, who was born at Antioch—as his appellation implies—and died at Mecca about 1599, compiled an alphabetical list of *materia medica* and an incomplete treatise on medicine, known as his *Tedkirat*, which Dr. Leclerc found to be held in high esteem in Algeria some sixty years ago,

¹ *Histoire de la Médecine arabe*, ii, 225, et seq.

and which several Shawiya practitioners have informed me that they regard as the best work on botany they possess. From it one doctor in a remote village of the hills had learned of the transmission of medical science by the Greeks to the mediaeval Arabs, an item of knowledge which most of my native friends appear to ignore.

The most modern of our five authors is undoubtedly the best known to existing practitioners in the Aures, namely, Abderrezzaq, known as 'the Algerian'. Born in Algiers in the first half of the eighteenth century, he travelled several times to Mecca, collecting, in the course of his wanderings, the notes embodied in his *Kashef er Rumuz*, the treatise on materia medica in alphabetical order which has been translated into French by Leclerc, and which, printed in Arabic at Tunis, is to be found in the hands of almost every Shawiya doctor to-day. It is chiefly inspired by the works of Avicenna, Ebn el Beitar, and especially, of Daud el Antaky.

Trained, then, and to some extent practised in his art during his apprenticeship to a master, and equipped with some of the works of the medical writers we have enumerated, the young practitioner of the Aures sets out upon his career undistinguished by any outward sign in dress or special appellation other than the prefix 'Si' to his name, which, should he be able to read, he shares with all lettered natives of Algeria (Pl. I, *a*). Those practitioners of the hills who are quite illiterate are in the habit of seeking the assistance of a scribe or of an 'educated' friend upon the rare occasions on which they require to consult their books.

All of the doctors with whom I became acquainted were obviously intelligent and members of the 'upper classes', if the word 'class' can be admitted in referring to one of the most democratic peoples of the world. They were always comfortably situated with regard to finance, some of them being really wealthy, their possessions consisting rather in gardens and in flocks than in actual money, for the Algerian native usually invests his capital in these as soon as he has saved enough to make a profitable purchase. I have always found them to be courteous, hospitable, and, when once their confidence has been gained, reliable, generous friends; the

one or two exceptions being suspicious, usually aged, practitioners who could never be persuaded to place their confidence in me, and were, accordingly, unwilling to help me in my researches while quite ready to accept any gifts of instruments, &c., which I might feel disposed to offer them.

They are invariably general practitioners practising both medicine and surgery, but, of course, some considered that they excelled in one of these sciences more than in the other, so that I have heard more than one man confess that, while he prided himself upon his surgery, he did not know much about medicine, and vice versa ; though I believe that the few who disclaimed especial surgical skill may have done so with a view to concealing the instruments with which they worked, for all those with whom I became really friendly seemed to regard surgery as a higher art than medicine. It is not infrequent to find among them men who specialize in some particular branch of their profession, such as the trepanning experts of the Jebel Shershar and elsewhere, two oculists, both of whom are natives of Morocco, and a very successful practitioner whose favourite cases are those in which he can display his skill in reducing dislocations. In referring to any doctor as 'successful' I have been guided solely by the reputation he enjoys in his own country, for it is quite impossible to get at any figures which would enable one to estimate their percentage of success and failure. Success is due, under God's will, to the skill of the doctor, failure, and death to the will of God alone ; a point of view, agreeable enough to the doctor, which is readily shared by his fanatical Mohammedan patients.

If this fatalism of the native has done much to keep alive Shawiya surgery even in areas whence skilled European doctors can fairly easily be reached, the Moslem's dread of amputation, with its unpleasant consequences in the next world, has done even more. A considerable number of cases have come to my notice in which the patients have, in the first instance, been taken to a European hospital, where amputation of a limb has been pronounced to be necessary. Refusing to undergo the operation, these patients have been removed to their mountain homes, and there, after treatment

by native practitioners, have recovered, doubtless owing to their remarkable hardiness, without the loss of a member. These triumphs of Shawiya surgery are remembered when failures are forgotten, and the successful practitioner loses no opportunity of quoting them as instances of the superiority of his methods over those of the European.

The doctor visits in their own homes such patients as cannot, owing to their condition, seek him in his house, the market-place, the street, or, in fact, anywhere; for, as a rule, no special place is set aside for consultations or treatment.

When on his rounds he carries his instruments, dressings, and his little medicine bottles of reed in a leathern bag with several pockets, such as can be seen hanging from the saddle of most desert horsemen when travelling.

In the case of a doctor whose reputation is very wide (and some of them treat patients from many miles distant), the sick are usually brought to his village by their relations and lodged in the house of some friend or, in the case of nomads, in their tent pitched outside the village, the doctor visiting them there; sometimes, however, a doctor will undertake a considerable journey to treat a case, though they not infrequently fail to respond when summoned to a distant patient.

I have only once found a doctor, or rather a family of doctors, who provided any accommodation for distant patients in the hamlet in which they lived (Pl. I, *b*). This consisted in a dingy stone hut, some eighteen feet in length by twelve in width, devoid of any sort of furniture, in which were housed three surgical patients, each attended by one or more relatives, who looked after them and prepared their meals. The rugs or sacks upon which these people slept were their own property, the doctors providing them with nothing beyond the bare room in which they lived. Occupying, as we did, the hut adjoining this primitive 'hospital', the groans proceeding from which rang in our ears all night, my wife and I were well able to observe its squalor and the miserable condition of its inmates, who, however, were well on the road to recovery as a result of the surgeon's treatment of their injuries.

When visiting a patient the practitioner wastes no time in getting to work. He is, as a rule, sympathetic in his manner,

and, though he sometimes derides those from whom his methods of treatment wring groans of agony, he seems to do so more from a desire to distract the patient's attention than from sheer brutality. I have, however, heard a doctor use most obscene language to a little girl from whose lip he was attempting to remove an excrescence (a result, he said, of maternal impression) by 'stringing' it with a cow's sinew steeped in ointment, the child having failed to respond to the gentler manner in which he first approached her.

It is customary for the patient or his relatives to offer the doctor such hospitality as they can afford; for example, a bowl of milk or a cup of coffee in the case of poor persons, or a dish of meat and semolina in richer households, while often gifts of dates or figs are pressed upon him at his departure. These gifts are not intended to form part of his fee, which would usually be paid in money.

The fees asked for attendance seem to depend largely upon the patient's capacity to pay. I know of one surgeon who ordinarily receives from about fifty to sixty francs for a simple trepanning operation, and up to one hundred and fifty for a more difficult one; and of another practitioner who asked a friend of mine the sum of fifty francs for medically treating his wife (my friend had, in addition, to purchase some drugs required); but most practitioners appear to behave very generously to the poor, often refusing all remuneration, and in some cases even providing destitute patients with food; indeed, I have never heard of a Shawiya or nomad doctor who would refuse his services to a neighbour even should he well know that they must be given gratuitously to a patient unable to pay. The natives themselves are by no means willing to incur the expense of professional treatment if the patient can be cured at home; it is common, therefore, for cases to be considerably complicated by the injudicious use of folk-remedies suggested by members of the patient's family before the doctor is called in.

It would not appear that any special study of anatomy is undertaken by the Shawiya during their apprenticeship to a practising doctor; indeed, they would seem to gather such information as they can upon this subject by watching their

master's work. Thus the majority confess that their knowledge of many of the organs of the body is very limited, so that I have only been able to find one doctor who would attempt to draw for me an anatomical chart (here reproduced, Fig. 1), and all those I have questioned on the subject denied that they possessed any old charts from which they had studied anatomy. Practical experience when watching their master at his work, of course, has taught them a good deal, and has made them well acquainted with the position of bones and of the principal organs, as well as of arteries, many veins, and muscles.

With regard to physiology, the following details of an operation, which a widely respected surgeon considered to be his greatest triumph, will serve to demonstrate the ignorance of the Shawiya. A bullet had traversed the patient's body, passing out in the vicinity of the kidneys, and causing a quantity of fat to protrude from its exit hole; this fat the surgeon cut away and, having boiled it down, caused the patient to drink it, 'in order that it might return to its proper place in the body'. This, in the opinion of the surgeon, it did, and the patient recovered.

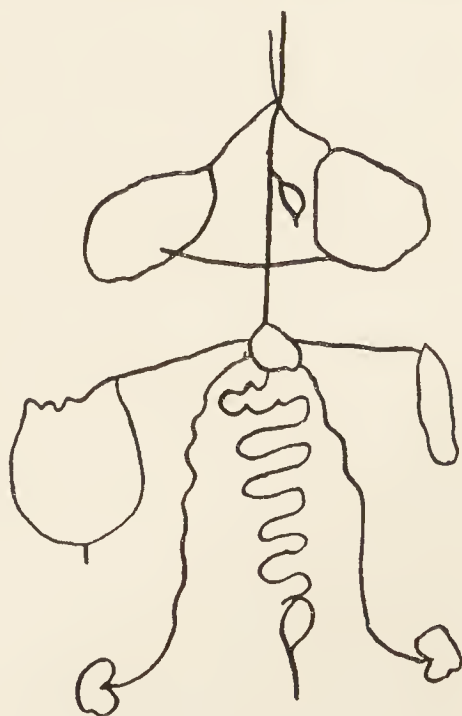


FIG. 1

As with anatomy, so with the theory of medicine; the Shawiya doctor appears to treat the cases which come before him more in the light of the experience gained in his apprenticeship than from any great knowledge of the theory of medicine that has been handed down to him; namely, the Humoral Doctrine of the Greeks as presented by the Arab writers. Nevertheless, all the practitioners with whom I discussed the subject possessed some knowledge of this theory, which I will set forth as exactly as possible in the form in which it was explained to me by one of my native medical friends, whose statements were corroborated by others.

The physical condition of man comprises four characteristics, Hot, Cold, Damp, and Dry, each of which must be maintained or the individual will die, as a four-legged chair collapses if one leg of it is removed—the simile is the doctor's. Diseases and all *materia medica* possess these same characteristics, and may possess two of them; so that a drug may be Hot and Dry or Cold and Damp, and so forth; but my informant appeared to disregard the degrees in heat, dryness, &c., recognized by the ancient authors.

Disease must be combated by means of drugs possessing qualities opposite to its own; thus a Hot and Dry complaint should be treated by means of Cold and Damp remedies.

In the case of plants, different parts of the same plant may have different characteristics. To ascertain the characteristics of his material the doctor is compelled to have recourse to his books, for this knowledge is too elaborate to be retained in his memory; indeed, when stating from memory the characteristics of honey, one of the most used medicines of Algeria, he described it as Hot and Damp, whereas *Abderrezzaq*, whose work he uses, calls it Hot and Dry,¹ a mistake on the part of the doctor which would seem to support my suggestion that practice and not theory is the basis upon which the *Shawiya* practitioner works.

Another native doctor described the four characteristics referred to above as belonging to Fire, Water, Air, or Earth, instead of Hot, Cold, Dry, or Damp.

In diagnosing a disease its characteristics may be ascertained by the following symptoms: in Hot diseases the pulse beats at nearly twice its normal rate and the patient is thirsty; in Cold diseases, the pulse beats at only three-quarters of its normal rate and the patient is not thirsty; in Dry diseases the patient suffers from irritation of the skin, which he scratches frequently; in Damp diseases the patient has a feeling of nausea and drinks but little, while he craves for fruits such as oranges and pomegranates.

Another practitioner, however, arrives at the characteristic

¹ Leclerc's trans., p. 266.

of the disease by other symptoms; in Hot maladies the patient feels hot, while in Cold ones he feels cold; in Dry ones he is constipated; in Damp ones he suffers from diarrhoea and saliva flows from his mouth while sleeping; Damp diseases in the opinion of this practitioner, are usually those in which the spleen is affected.

Such is the theory of medicine as understood by the Shawiya doctors of to-day, but, in addition, they hold a number of quaint beliefs on that border-line between medical science and magic which, among a people still in a primitive state of culture, is necessarily very indistinct. Thus they consider that earth (sometimes used as a styptic) must be good for the human body because the latter is sprung from it; that the fat of a lizard, a species of *varanus*, is useful in medicine owing to its resemblance (real or imaginary) to human fat; and that the locust is valuable as a drug because, in devastating a country-side, it consumes medicinal herbs. Some of their materia medica, the uses of which will be found described in the following pages, are evidently borrowed from the sorcerer's defensive armoury against demons or 'jenun'.

These disease-spreading beings are popularly supposed to dislike coral owing to its colour, asafoetida because of its smell, pepper on account of its taste, and a gall-bladder owing to its bitterness; while, being subject to death, they are supposed to avoid those who wear upon their persons such 'spiteful' creatures as scorpions or vipers, even though merely the dried body, or fragment of the body, of the reptile be so worn.¹

Although the wearing of charms is recommended rather by sorcerers than by the practising doctors of Aures, one of my medical friends described to me a treatment by means of such a charm which may well afford an instance of the combating of disorders by 'suggestion', which Professor E. G. Browne believes to have played an important part in Arabian medicine².

¹ Hilton-Simpson, 'Some Algerian Superstitions', *Folk-Lore*, vol. xxvi.

² Browne, *Arabian Medicine*, p. 90.

One eye of the owl is constantly sleepy, the other as constantly wakeful. Upon placing the two eyes in a bowl of water the sleepy one sinks immediately to the bottom, while the wakeful one floats upon the surface. Persons suffering from insomnia are advised to wear the sleepy eye suspended from a cord around the neck, while those who sleep too much wear the wakeful one. In describing a similar treatment in his *Sorcellerie au Maroc* (p. 144) the late Monsieur Mauchamp states that in that country the eating of the right eye of the owl is believed to induce sleep, and of the left one to prevent it.

If their acquaintance with anatomy, physiology, and the theory of medicine is limited, the Shawiya doctors can at least pride themselves upon their practical knowledge of botany. They believe that every member of the vegetable kingdom has its use in medicine if only that use were known, and they employ a very large number of the plants with which even their barren country abounds. The doctor, as a rule, himself collects the wild plants and possesses a very intimate knowledge of the localities in which they grow, while such varieties as are not to be found in the Aures, but flourish in other parts of Algeria, he purchases, dried, in the native shops of large centres such as Biskra. Thus, for example, although sarsaparilla is said by the Shawiya to grow upon the plateau near Batna, it is considered to be inferior for the treatment of syphilis, for which it is used, to the dried plant imported from abroad, and the latter is accordingly purchased. The names of the local herbs employed, even in the Arabic spoken by the nomads, are frequently different from those used by old Arabian writers, whereas the names of other medicines, obtained by purchase, are very commonly those to be found in the *Kashef er Rumuz* of Abderrezzaq.

Materia medica other than that obtained from fresh plants, such as sulphide of arsenic, acetate of copper, alum, candy sugar, the dried myrobalan of commerce, seeds of the ash-tree, &c., are all purchased in the shops of those enterprising Berber merchants of the Sahara, the Mozabites, who are established in almost every Algerian town, while sometimes a vendor of drugs may be found in markets such as that of

Biskra, seated upon the ground with his wares displayed in little heaps around him. In the index of materia medica at the end of this volume drugs thus purchased are marked with the letter M.

Having collected his fresh herbs the doctor proceeds to the manufacture of his medicines. Those which require to be dried are always placed in the shade for this purpose, unless a note to the contrary appears against them in the

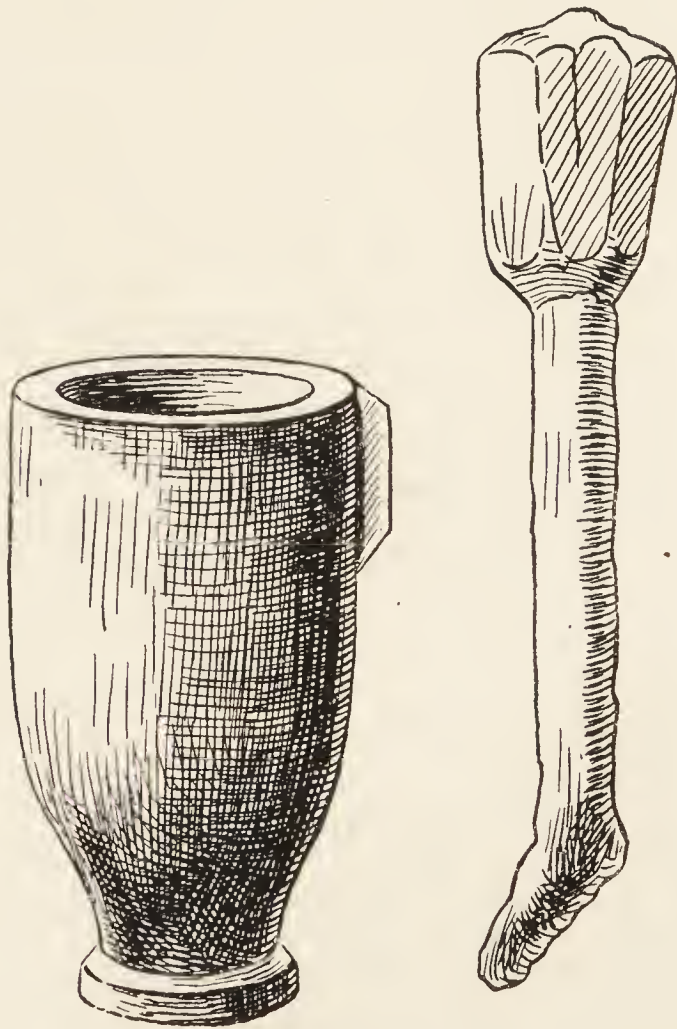


FIG. 2.

list of treatments which follows, for drying in the sun causes the plants to lose much of their strength.

Extracts of fresh herbs are obtained by pounding them in a locally made wooden mortar (Fig. 2), about a foot in height and four and a half inches in diameter (inside measurement), with a wooden pestle, the large boss upon the upper end of which gives it considerable weight; while other materia medica seems to be reduced to powder by means of smaller, but heavy, pestles and mortars of brass which are procured in towns.

Some practitioners, but it is said only a very few, produce their rose, violet, and orange-water, as well as a distillate of *Artemisia herba alba*, used as cure for colic, by means of a 'still', of which I was lucky enough to obtain a specimen. This apparatus, of which I give illustrations (Pl. III, a, Fig. 3) is made of tin and is employed as follows :

The 'still' is composed of two main parts, the receptacle for the substance to be distilled, and the condenser, which is fitted into it above to form a lid. The receptacle, A, contains about five litres of liquid ; four-fifths of this capacity is taken

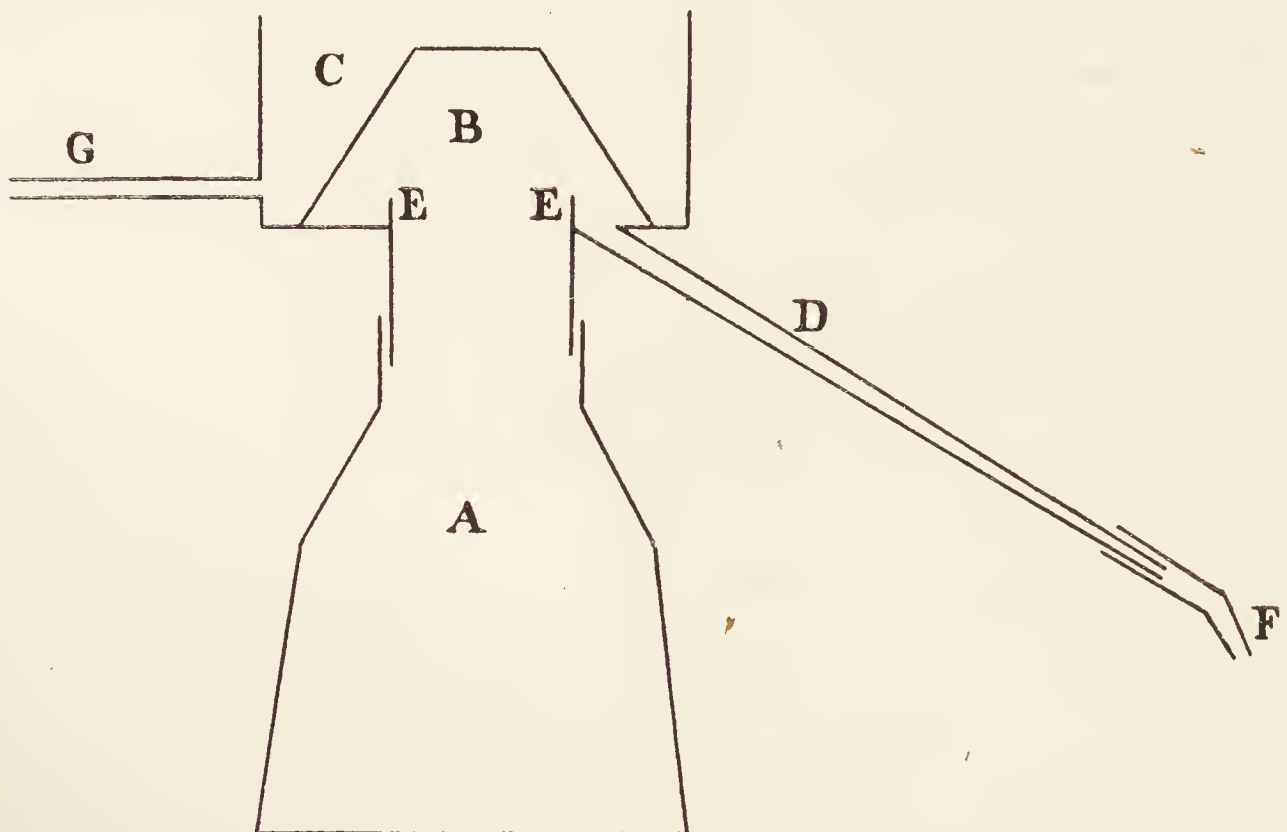


FIG. 3.

up with water, and the remainder filled with the herb which is to be used. The 'still' is then placed upon a rough locally made earthen bowl, about ten and a half inches is diameter, measured to the exterior of its thick but friable sides, from the rim of which three triangular bosses project towards its centre to support the 'still', and in the sides of which three rectangular holes admit a draught of air to the charcoal fire which the bowl contains. As the liquid in the receptacle, A, commences to boil the steam rises to the conical condenser, B, upon which it is cooled and converted into fluid with the aid of cold water in the trough, C, which encircles the condenser. This fluid runs down the sloping sides of the

condenser and, being prevented from returning to the receptacle, A, by means of a flange, E, its only exit is to be found in the sloping tube, D, which with its bent nozzle, F, conducts the distillate drop by drop to a bottle placed ready to receive it. As the water in the trough, C, becomes hot, and so useless for the cooling of the steam, it is drawn off by means of the spout, G, which is blocked with a cork when not in use, and a fresh supply of cold water is poured into the trough. The junction between the nozzle, F, and the bottle in which the distillate is to be stored is hermetically sealed with dough during the process of distilling.

The apparatus was secretly made in a large town by a Jewish tin-smith and was copied from a copper specimen belonging to the brother of the doctor from whom I obtained it; the old copper specimen having been handed down in the family from an unknown date.

The same doctor described to me, from memory, another form of 'still' of which I have not yet seen a specimen. From this description I made a drawing, here reproduced, which the doctor passed as correct (Fig. 4). Obviously the sketch is inexact in some details, since it is not apparent how the material gets into the apparatus; but I have thought it advisable to place it before the reader in the form in which my Shawiya friend approved it.

Water is placed in a white metal-lined bowl, A, through a hole, B, in the side of which passes a pipe, C, from the lower extremity of the cone-shaped condenser, D. In this condenser, which is of metal and provided with no means of accelerating cooling by evaporation, is placed a fine linen bag, E, containing the material to be distilled. The condenser contains no water, but, when the apparatus is placed upon

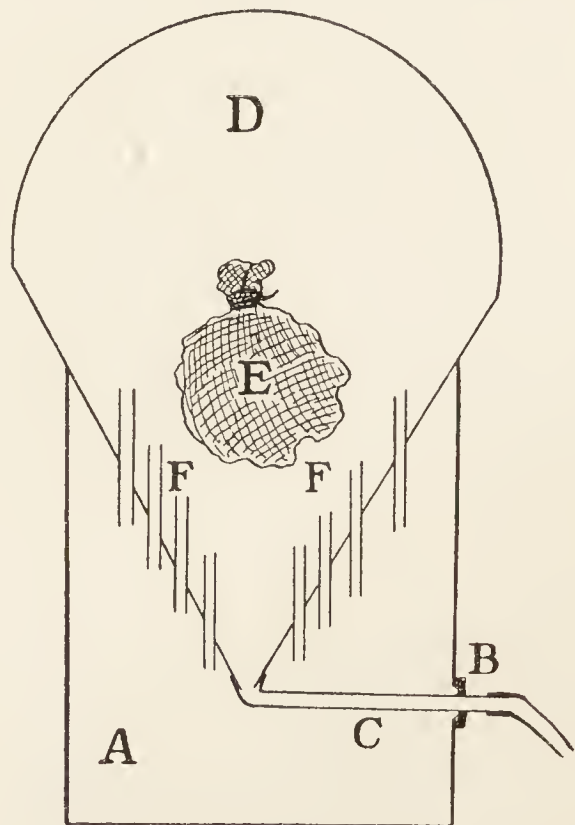


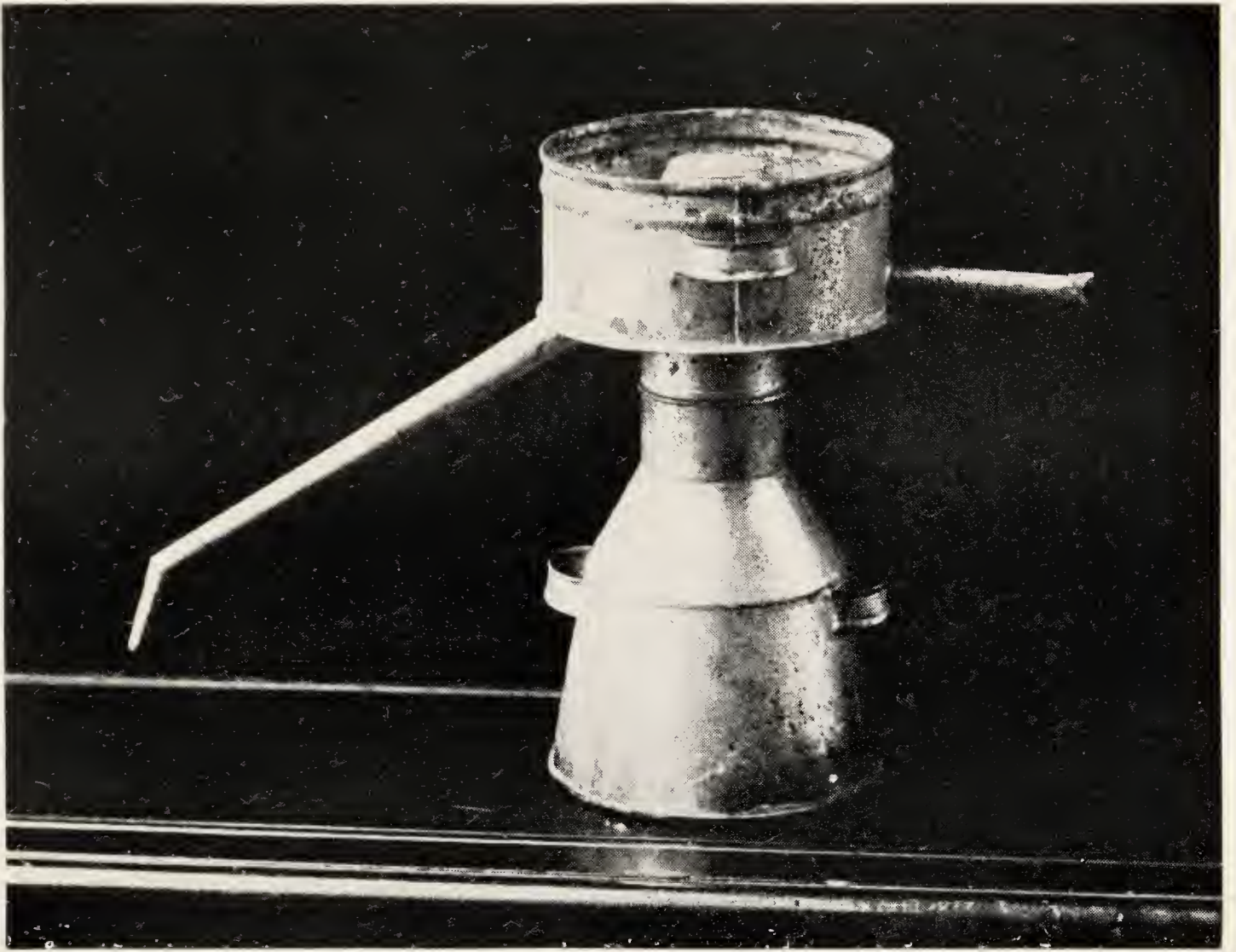
FIG. 4.

the fire, the steam arising from the water boiling in A passes into D through a number of vertical tubes, F, the projecting upper ends of which prevent the fluid from exuding by the same channel and cause it to pass out of the condenser by way of the pipe, c, to a bottle placed ready to receive it. The hole, B, is blocked with dough when the pipe, c, has been passed through it in order to avoid leakage of steam.

Concerning the origin of these 'stills' I could obtain no information of value. One practitioner attributes their invention to a mythical personage in times of the greatest antiquity, another states that they are described in an 'ancient book', but he is ignorant of the name of the book or its author. Certain it is that a very vague reference in verse to the process of distillation by means of an apparatus 'with holes in it' is to be found in a recipe for rose-water in the pages of the *Taj el Muluk* by Mohammed ibn El Haj el Kebir, who may well have been attempting to describe the second of the two types of 'still' mentioned above. The only copy of this work I have as yet been able to see (a cheap modern reprint produced in Cairo) is undated. Shaw, about 1720, noted the use of a 'still' for the preparation of spirituous liquors in Algeria, to which he refers as 'the alembick', the distilling apparatus of the modern practitioners being known to them as 'el ambi'aq'.

The medicines distilled by means of this apparatus are sold for high prices, the distillate of *Artemisia* (which is said to cure colic in five minutes) realizing ten francs per litre, while that of orange flowers is sold at fifteen francs for the same quantity.

The weights and measures used in describing doses by Abderrezzaq, though known to the Shawiya through his book, are not used by them; indeed, the doctors as a rule measure their medicines by means of the coffee-cup, coffee-spoon, and soup-spoon, all of European manufacture, which are to be found nowadays in every household of the Aures, and some few of them, who have procured French scales, even talk about grammes, but I think that for measuring drugs the household utensils mentioned above are in practice far more frequently used than modern weights.



A STILL

b



SKULL FOUND NEAR EL QANTARA

The scales used by those who have not a more modern instrument consist of two halves of a gourd about six inches in diameter, neatly cut across, suspended by strings, one from each end of a wooden bar, which is itself suspended at its centre by a loose wooden joint from a small handle of wood, so that it can dip to either side as the substances to be weighed are placed in the cup-like receptacles formed by the two pieces of gourd (Fig. 5). Other apparatus, with the exception of surgical instruments, appears to be absent from the home of the Algerian doctor; his bottles usually consist

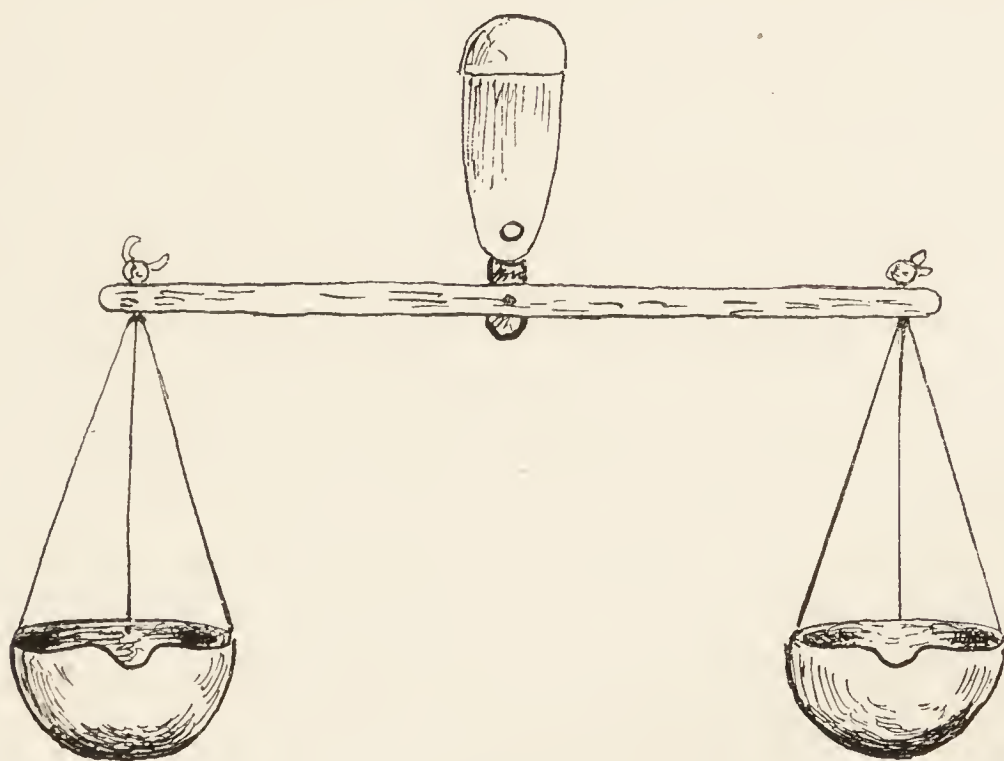


FIG. 5.

of small cylinders of reed, stoppered with plugs of rag, and the wool he employs is readily obtained from his own sheep.

In the high parts of the Aures, where the cedar, the juniper, and the pine are to be found in profusion in the forests, the doctors and others extract their pitch, which as we shall find is largely used in medicine, in the following manner.

The wood is hewn into small pieces and placed in an earthen bowl, which is then turned over on to a dish of the same material, to which it is joined with damp earth in such a way that the pitch can only exude through a channel left open for the purpose. I believe that special kilns of pottery are made for the extraction of pitch, but I have never seen

one myself. The kiln, or the bowl and dish, enclosing the wood is then covered with brushwork and rubbish, which is set on fire and replenished for some time: a process exactly resembling the baking of Shawiya pottery. As the wood in the kiln becomes hot the pitch runs out through the channel left for its passage, to be caught in a bowl or other receptacle ready to receive it.

From the books to which the Shawiya doctor refers, and from the fact that in the latter half of the thirteenth century there existed at Bougie on the Algerian coast (then a dependency of Tunis) a number of medical intellectuals,¹ there seems little room for doubt that the medicine practised in the Aures to-day is derived from that of the mediaeval Arabians, and it seems likely that it crept into the fastnesses of these rugged hills as a result of pilgrimages undertaken by devout Berbers after they had embraced the faith of Islam, to remain (like other arts of the Shawiya) but little changed in the lapse of time. Indeed, I have heard it suggested by natives that a man who learned his medicine in Egypt had, at some uncertain date, introduced it into the Aures.

The origin of the surgery described in the following pages is, however, obscure. As Doctor's Malbot and Verneau have pointed out in their paper on trepanning among the Shawiya,² which paper my own notes will be found to amplify rather than to correct, the instruments now used for this operation are more primitive than those employed by Hippocrates, to whom the circular trephine was known, and the French authors therefore conclude that trepanning had been practised in the Aures before the Romans brought their own civilization and the healing art of the Greeks to the country round, and they consider that the operation may have been carried out in the Aures from neolithic times.

The instruments, of which I illustrate a number of specimens from the Pitt-Rivers Museum and from my own collection, are certainly primitive in form and crude in workmanship. Each surgeon designs his own tools, cutting out with a pair of French scissors a pattern of the blade required in a

¹ Leclerc, *Hist. Méd. arabe*, ii. 252.

² *Anthropologie*, viii. 175.

sheet of paper, without first drawing an outline of it. This pattern he takes to the local jeweller who, for a very modest sum, casts the blade in a little mould in which he makes the silver brooches, charm-cases, bracelets, &c., so dear to the hearts of the Shawiya women, when, a plain round wooden handle having been affixed to the blade, the instrument is ready for use. These roughly fashioned tools appear to serve their purpose for many years, most of the surgeons I met with having in daily use instruments which had been handed down to them from their grandfathers.

If it is difficult to establish the origin of Shawiya surgery, it is no easier to point out the relation of the healing art of the Aures to that of other districts of Barbary, for, in the existing state of our knowledge of the ethnography of North Africa, it is hard to ascertain where and to what extent this healing art is or has been practised at all. Horneman, who travelled in Fezzan in 1797-8, while noting the treatment of 'various sorts of venereal disorders', for which he says, the native doctors successfully employed salts and the fruit of colocynth,¹ has no more to say of the surgeons of that country than that they possessed sufficient ability to cure a simple fracture'.² Richardson, however, writing in 1848, states in his *Travels in the Great Desert of Sahara*³ that at Ghadames 'in dropsy the native doctors cut the body to let out the water, as we do', and he describes the medicinal use in Fezzan of a lizard, *Uromastix acanthinurus*, employed by the Shawiya doctors to-day.

In the great desert to the south of Algeria, among the Tuareg (Berber) nomads, certain materia medica, such as sarsaparilla, appear to be employed in much the same way as in the Aures massif, but I have so far failed to find in the literature relating to these regions any reference to doctors who practise medicine and surgery in any way comparable to that carried on by the Shawiya.

Turning to Morocco we find that Leo Africanus, himself a Moor, writing in the sixteenth century, asserts that in Hea, a district in the south-west of that country, there existed in his

¹ *Travels from Cairo to Mourzouk*, p. 73.

² *Ibid.*, p. 74.

³ i. 323.

day 'neither Physician nor Surgeon of any learning or account', and that cautery was the sole treatment for all ills, though circumcision was practised by specialists. Professor Edmond Doutté, the eminent French orientalist, whose profound knowledge of the customs and beliefs of Barbary must entitle his opinion to the greatest respect, tells us¹ that at Ar'mat, near Marrakesh, 'la médecine ne se distingue pas encore de la magie'. On the other hand, Dr. Raynaud, in his *Étude sur l'Hygiène et la Médecine au Maroc* (1902), describes a condition of medicine and pharmacology, emanating from the institutions of once-learned Fez, similar to that existing in the Aures, though the surgeons of Morocco, whose work he mentions, appear to be far less enterprising than the Shawiya.

Unless we are prepared to believe that surgery such as the operation of the trepan has existed in the Aures from very early ages, rendering the massif a district singularly receptive for later advances in the healing art, it is hard to understand why the medicine practised in their remote valleys by the Shawiya of to-day should find its parallel in the neighbourhood of a seat of learning once so famous as Fez, when, as far as I can discover in the literature of Algeria, the country around the massif has produced no practitioners of medicine and surgery whose activities have attracted the attention of writers in ancient or modern times. If the origin of Shawiya surgery is obscure, its future seems easy to foretell. It cannot endure much longer. The very numerous men of the mountains who served France in the Great War have already introduced many seeds of change and progress into the remote valleys of the Aures massif. They have learned, through their experiences in the hospitals of the various theatres of war, that European methods of medicine and surgery are not limited to the giving of a purge and the amputation of a limb, as so many Shawiya doctors have solemnly assured me. With the advent of faith in modern methods the art of the native practitioner must disappear, however gamely its exponents may, and will, struggle for its existence.

¹ *En Tribu*, 1914, p. 26.

Before he passes from the stage for ever, cannot the surgeon of the Aures be made to fight one last round against his country's greatest enemy, venereal disease? Cannot the man who, as we shall note in the following pages, makes light of the removal of bone from skull or limbs be taught to wield the syringe?

To this question a layman dare hazard no reply, but I know, from many inquiries made among the practitioners of the Aures, that the hitherto conservative surgeon of the mountains would eagerly embrace any opportunity (tactfully introduced) of learning those modern methods of dealing with the scourge which display an immediate effect, and I am equally certain that their patients would as eagerly demand the treatment, for which they would undoubtedly be prepared to pay sufficiently to render its introduction by no means an act of charity on the part of the introducer. This much, I am sure, would the Shawiya doctors be ready and willing to learn from the European, but probably nothing more.

In the two following sections of this little book I shall merely endeavour to describe, as they were explained to me by my doctor friends of the hills and the desert, those of their operations and methods of treatment upon which I have been able to glean information.

PART II

SURGERY

Styptics

It would appear, from the numerous requests I have received for some good material wherewith to check haemorrhage, that the natives do not place much faith in the styptics known to them, among which I found that the following are applied to wounds :

(a) Ashes of rag or of paper.

(b) A piece of *dirty* wool dipped in *olive oil* (dirty wool is sometimes used in surgery in preference to clean).

(c) The pounded green leaves of *Solanum nigrum*.

(d) The fresh leaves or bark of the *walnut tree*.

(e) Dried *goat's dung*.

(f) Damp *earth* (which 'must be good for us since we are sprung from it').

(g) Powdered *gallnut*, or

(h) *Sulphide of copper* which is rubbed lightly on a wound to check haemorrhage by causing the tissues to 'swell'.

Nose bleeding is arrested by the taking of *snuff*, which, in the form of powdered leaves of *Juniperus phoenicea*, L or of *tobacco*, is commonly used in the Aures.

Asepsis

Although the surgeon not infrequently makes incisions by means of a red-hot cutting instrument, this appears to be done solely in order to check haemorrhage, and no attempt is made to secure surgical cleanliness. The surgeon washes his hands and his instruments *after* use in any water, hot or cold, clean or dirty, which may be at hand, and he uses for his pads and bandages strips of dirty cotton dress material and wool supplied by the women of his patient's family. In

addition to this, the patient himself is often in an extremely dirty condition.

Anaesthetics

It may be taken as a rule that the surgeons of the Aures and the desert perform all their operations without the use of an anaesthetic, the patient being merely held down upon a half-grass mat, a rug, or a sack placed upon the floor (for tables are unknown in an ordinary Algerian household), while the surgeon carries out his task. An anaesthetic is, however, known to most, if not all, of the practitioners I have met, but they do not as a rule employ it merely because they are afraid of its effect. A very few of them might, perhaps, employ it in the case of a patient who was a relation or a great personal friend whose family could be relied upon to keep their counsel should the use of the anaesthetic prove fatal.

The only surgeon who confessed to having used *Hyoscyamus albus*, L. as an anaesthetic described the plant as 'a species of wild opium' and stated that its seeds are indistinguishable from those from which opium is prepared. He informed me that three grammes weight of the powdered fresh seeds, swallowed in rose-water, act as a soporific, but seeds which have been kept for two or three years are very strong, so that, powdered and consumed in water, they will keep a patient still for a quarter of an hour while an operation is performed; for, although he can feel a little pain, he will be unable to move while under the influence of the drug. This same surgeon told me of a, presumably, magical local anaesthetic which can be obtained from the excrement of the lizard *Uromastix acanthinurus*. The excrement is in two colours, 'white' and 'black'. The latter is useless, but the 'white' excrement, dried and powdered, is applied to wounds, such as those caused by a bullet, and acts as a local anaesthetic while some such operation as the removal of a foreign body is carried out.

Despite their knowledge of the use of *Hyoscyamus albus*, however, it may be taken that the surgeons of the hills and the Sahara perform all the operations hereafter described without the use of any anaesthetic at all, relying, as they

claim, upon their delicacy of touch to reduce the patient's sufferings to a minimum. In the fanciful language of the Algerian native, one surgeon has informed me that a really skilful operator can cut through the shell of an egg without damaging its inner membrane, and all maintain that so gentle are their methods that their patients never faint during the operation. Nevertheless one of them stated that he restores such patients to consciousness by throwing water in their faces or holding onions beneath their noses.

One successful operator told me that he used no anaesthetic, but added, 'I look at the patient and he looks at me'. Whether or not this chance remark may refer to the practice of hypnotism I am quite unable to decide, but I have never obtained another shred of evidence to support the theory of its use.

Trepanning

We have already seen that the scar of the trepan is very frequently to be found upon living natives in and around the Aures massif, at once a proof of the existence of the local surgeon and a testimony to his skill. The removal of bone from the skull is, certainly, the most important operation which the Shawiya surgeon attempts, and is the one in which he glories above all others; he, therefore, performs it with remarkable frequency. The operation, though believed to require care, is certainly not regarded by the modern practitioners I have met as critical or even dangerous, indeed Doctors Malbot and Verneau¹ throw an interesting light upon the native's point of view with regard to injuries to the skull when they state that the fine imposed in several tribes of the Aures for breaking a man's head was formerly identical with that payable for knocking out some of his teeth, and, further, that Shawiya women have been known to undergo trepanation in order to support fictitious charges of assault against husbands from whom they were seeking grounds for a divorce!

The native surgeons I have met with are unanimous in declaring that injuries resulting from a blow are the sole

¹ *Anthropologie*, viii. 185.

cause of their favourite operation, which, they assert, is never resorted to for the relief of a malady not so caused, and is not performed as a magical cure in cases of persons supposed to be 'possessed' by demons. Doctors Malbot and Verneau state that trepanning is sometimes carried out years after the infliction of the injury which it is intended to relieve, but some of my informants declared that unless the operation is performed within seven days of the accident the patient will die; I have, however, known of cases in which a considerable number of weeks has elapsed before the injured skull has been opened.

Upon this point, therefore, the Shawiya surgeons appear to hold diverse opinions. All the practitioners I consulted agreed that on no account must the *dura mater* be disturbed, as death will inevitably result should this be done, and that the sutures, which are believed to be the patient's destiny written by the hand of Allah, must be left untouched by the operation. Should doubt exist as to whether or not the skull be fractured, one doctor is in the habit of giving the patient (if conscious) some hard substance, such as a grain of corn, upon which to bite, inability to do so being taken as indicative of fracture.

Scalping is performed in various ways. One practitioner, who had himself undergone the operation when a lad, told me that in his case a piece of meat freshly cut from the right side of a goat, over its liver, had been bound upon the seat of the injury for three days, at the end of which time the scalp had been easily scraped away to allow of the operation. The majority of surgeons, however, completely remove a portion of the scalp, usually with the aid of a cylindrical or slightly oblong cutting instrument, resembling a gunmaker's wad-punch, used red-hot, in which the cutting edge is placed at right angles to the handle (Pl. IV, *a*, *b*), variants of this being small circular or diamond-shaped specimens with the cutting edge in the same plane as the handle (Pl. IV, *c*, *d*), which had been designed by one successful operator. The instrument is firmly applied to the scalp, which is burnt through to the bone, and then removed by means of a scraping movement when the hot iron reaches the skull.

When scalping with the knife (the ordinary Algerian knife with a blade about $7\frac{1}{2}$ inches in length and a rounded point (Pl. IV, *e*)), or by means of the scalping-knife and saw combined (Pl. IV, *f* and Pl. V, *a*), some surgeons, having tied a handkerchief tightly around the patient's head in order to check haemorrhage, remove a rectangular portion of the skin in four straight cuts, others make two incisions intersecting at right angles and then turn back the points of the scalp which are retained by means of hooks (Pl. IV, *h, k, l, s, t*), or by a V-shaped spring inserted between the flaps (Pl. IV, *r*). I at first thought that this latter method, by which no portion of the scalp is actually removed, must have crept into the Aures at some quite recent date, possibly as a result of rumours of European methods which might have penetrated to the hills, but I found later that its stoutest champion was a very aged and extremely conservative surgeon, whose reputation is very wide and who regards with the greatest contempt the European doctor and all his works: a person who, I am sure, would sooner die than practise any innovation in his art.

Some practitioners employ the knife cold, others red-hot, while some use an instrument especially made for the making of incisions by means of a red-hot blade (Pl. IV, *g*). This instrument has three cutting edges, and is also used in operations upon other parts of the body than the skull. The long curved edge is intended for long straight cuts, the shorter straight one for smaller incisions, made by means of a saw-like manipulation of the instrument, while the sharp rounded end is used for the opening of abscesses.

When the scalp over the seat of the injury has been removed or turned back many surgeons scrape away tissues adhering to the bone with the aid of fan-shaped scrapers (Pl. IV, *j* and *q*), used also as spatulae, or of a combined saw and scraping instrument (Pl. V, *e*), one practitioner stating that he treats the surface of the bone with powdered bark of *Juniperus phoenicea*, upon which a little warm butter is poured, before commencing to work upon it. Sometimes it is found that the mere scraping of the damaged bone is all that is required, in which case the operation is quickly at



SCALPING INSTRUMENTS



RETRACTORS, SCRAPERS, AND DRILLS

at an end ; the removal of a piece of bone, however, frequently occupies a considerable time and is carried out in different ways by different surgeons.

The first step in the operation, after the scalp has been cleared away, usually consists in the perforation of the skull by means of a drill, though one or two practitioners I consulted disapprove of the use of a drill in operations on the head. Where the perforation is complete its object is to let out any pus or blood which may be beneath the bone, but one surgeon told me that he had removed a considerable quantity of bone by means of nearly contiguous perforations with the drill, the bridges left between the holes being subsequently cut away with the saw or knife, while others use the drill merely to produce a shallow hole in order to serve as a starting-point for the saw.



FIG. 6.

In the latter case several holes are sometimes made with the drill ; for example, where cracks in the bone radiate from a central punctured wound, one surgeon informed me that he applies the drill to the extremity of each crack, subsequently connecting the holes thus made by means of the saw, and so removing the area of bone affected by the cracks. In the opinion of most practitioners, however, the drill should be applied to the 'good' bone just clear of the damaged surface, and, therefore, beyond the extremities of the cracks.

The drill, which is operated by spinning between the palms of the hands, is to be found in various forms, in nearly all of which excessive penetration is artificially prevented owing to the surgeon's horror of so much as touching the *dura mater*.

The simplest type of drill (Fig. 6) consists of a flat iron blade projecting some $2\frac{3}{4}$ inches from a plain round wooden handle $3\frac{1}{4}$ inches in length. Near the distal end this blade is $\frac{3}{8}$ inch in width, but it narrows abruptly, leaving a 'shoulder' at each side, so that the last $\frac{3}{8}$ inch is but $\frac{1}{8}$ inch wide, its extremity being rounded and ground to a cutting edge. The

object of the 'shoulders' is automatically to prevent excessive penetration. A rounded point, varying in width from $\frac{1}{8}$ inch to $\frac{3}{8}$ inch, is to be found upon most of the drills I collected, but a drill with sharp trident points is recommended by some surgeons, the only such specimen which I secured being far more coarse than is usual (Pl. IV, *p*) and not intended for use in trepanning, for which, indeed, some surgeons consider the trident drill to be useless. From the oldest practitioner I met, who must have been nearly eighty years of age, I obtained a drill—once the property of his father—in which excessive penetration is prevented in a different way (Pl. IV, *o*).

The blade consists of a round iron rod, $\frac{1}{8}$ inch in diameter, projecting some $3\frac{3}{8}$ inches from a plain round wooden handle. The distal end is flattened into a curved cutting edge devoid of 'shoulders'. Over this blade is drawn a sleeve, consisting of a piece of wood, slightly conical in form, perforated throughout its length with a hole through which the blade is passed. When the sleeve is pressed right home to the wooden handle about $\frac{5}{16}$ inch of the blade projects beyond its distal end, but this amount can be reduced by pulling the sleeve nearer to the point of the blade and filling the gap thus created between the sleeve and the handle with a piece of string or rag tied around the blade. The sleeve having been thus secured to give the desired penetration, it serves, as do the 'shoulders' in other drills, to check any further penetration by the point.

The majority of surgeons appear to use drills such as are described above, in which the handle consists of a single solid piece of wood; nearly all of them, however, had heard of the double-handled drill illustrated by Doctors Malbot and Verneau¹, and one practitioner stated that he used such a drill, of which he presented me with a specimen (Pl. IV, *m*).

In this drill the blade, which is 'shouldered' and has a wide rounded point, is rigidly fixed to the lower portion of its round wooden handle, and the handle divided into two parts, that to which the blade is fixed being loosely socketed into the upper part, which is hollowed in the form of a cylindrical cup, so that the lower portion of the handle may be spun between the palms while the surgeon maintains

¹ *Anthropologie*, viii. 178.

pressure with his forehead upon the upper end. A number of wooden pegs driven laterally into the upper part of the handle prevent the accidental withdrawal of the lower revolving portion, the upper end of which, concealed within the cup, is cut into the form of a knob against which these pegs would bear should an attempt be made to pull the two portions of the handle apart. The pegs, however, do not interfere with the spinning of the lower portion of the handle. The revolving portion of the handle of this drill, which is very old, is marked with incised lines in the form of a close spiral; the blade is a new one.

One practitioner in the Aures told me that the double-handled drill could well be operated by means of a bow, but the man from whom I obtained the specimen described above stated that this should not be done, for in his opinion the use of a bow would diminish the surgeon's control of his instrument, and possibly lead to undue violence when the perforation was nearly complete, with consequent fatal damage to the *dura*. The drill having performed its task the operation is continued with the saw. Most surgeons appear to complete the sawing in one *séance*, lasting about an hour and a half, but one practitioner is in the habit of reducing the strain upon his patient by making but a small incision with the saw upon the day on which he commences its use, returning daily to his work until the necessary amount of bone has been sawn round, a piece the size of a penny sometimes requiring from fifteen to twenty days before it is completely severed from the surrounding bone.

In using the saw some doctors steady the blade of the instrument against the nail of the left thumb, placed vertically upon the patient's head for the purpose; others lay the fingers of the left hand flat upon the patient's scalp beneath the haft of the saw blade in order to check accidental perforation of the skull when the bone is nearly cut through.

All the saws I collected, with the exception of one, lend themselves by their form to either method of manipulation. They consist of iron or steel blades projecting from rough round wooden handles, the distal end of the blades being flattened and, in most cases, turned down nearly at right

angles to their hafts, the lower edge of this turned down portion being serrated with teeth in the same plane as the handle. In some cases the turned down part of the blade is slightly fan-shaped (Pl. V, *a, c, f, h*), in others curved (Pl. V, *b*, and Fig. 7), according to the fancy of the owner.



FIG. 7.

In other saws the distal end of the blade consists of a flat rectangular surface, projecting at right angles to the haft on either side of it, in which one edge may be serrated, the end forming a scraper and the opposite edge a scalping-knife (Pl. IV, *f*); or it may be serrated on both sides, leaving the end for use as a scraper (Pl. V, *e*); or it may possess three serrated edges (Fig. 8).

One specimen collected (Pl. V, *a*) somewhat resembles a miniature battle-axe, of which one edge is serrated and the other fashioned into a curved scalping-knife, while another, which lacks the usual wooden handle, has a single serrated edge turned down at right angles at one end, the 'handle' end being flattened and slightly curved to form an elevator (Pl. V, *f*).

The teeth of these saws vary considerably in fineness; the coarser specimens having as few as three teeth to a quarter of an inch in length of edge, the finer ones as many as seven.

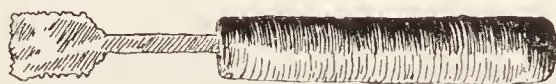


FIG. 8.

The solitary exception referred to above is a roughly made circular trephine (Pl. V, *j*), manufactured, like all other surgical instruments of the Aures, by a Shawiya jeweller, in which the central pin projects below the serrated edge and is immovable. The instrument is new, and the surgeon who gave it to me declined my offer of a fairly modern European trephine, as did all the others to whom I tried to present it, fond though they are of anything else in the way of European cutlery which can be put to a surgical use. For this reason I think that the instrument had been made as an experiment,



TREPANNING SAWS, ELEVATORS, AND WEIGHT



possibly according to a verbal description of a trephine observed by some native patient in a French hospital, and that it had been found useless to a surgeon who dreads disturbance of the *dura mater*, as do the Shawiya, owing to the immobility of the pin ; the man who gave it to me stating that he had never used it, and evidently attaching no value to it whatever.

The damaged piece of the skull, having been completely sawn round, is very carefully lifted out by means of elevators (Pl. V, *f, l, m*) and retractors (Pl. IV, *h, k, l, s, t*), some surgeons removing it immediately the work of the saw is complete, others leaving it in position for three days in order that the 'nerves of the bone', finding the bone to be dead, may 'withdraw' on the third day, others again leaving it for from ten to fifteen days, preventing the scalp from a tendency to close over it meanwhile by the application of a pad of cotton material soaked in *honey* and *butter*.

After the interval of ten or fifteen days the fragment of bone will be found to have risen so as to be easily removed. One practitioner, who immediately lifts away the bone after sawing, recommends a dressing of gum of the *Aleppo pine* melted with *sheep's butter* (six months or a year old) upon which he lets fall a few drops of *honey*, subsequently sprinkling a little of the finest *wheat or barley flour* upon the dressing. He then applies a pad of wool, which is retained in position by a rectangular leaden weight, slightly larger than the hole in the skull, and fitted with a boss on its upper surface, through which is passed a thread wherewith to raise it (Pl. V, *n*). The object of the weight, the use of which is recommended by several surgeons, is to check the tendency of the 'brain' to rise up through the aperture formed in the skull by the operation.

This dressing is renewed daily for a fortnight. After seven days the *dura mater* will be seen to have become 'steady' save for the pulsation permanently noticeable even when the scalp has closed over the aperture, and it will appear red in colour instead of white with red lines in it, as it will have appeared when first revealed by the operation. After a fortnight of daily renewal the dressing is replaced

every second day for a month or six weeks, at the end of which time the patient should be restored to normal health.

Another surgeon advises the sprinkling of *powdered burnt alum* upon the wound, over which he then places a pad; another uses the powdered leaves of *Ajuga iva*, Schreb., and *Teucrium polium*, L., mixed together, for sprinkling upon a dressing of *butter*, while another employs a *butter* dressing upon which is sprinkled some powdered *saffron* and *white cone sugar* before *pitch* of the pine is poured over it.

None of the surgeons apply stitches to the scalp, and none attempt to replace the bone removed by any form of artificial plate. I heard a couple of stories, however, of such replacement having been successfully attempted in the past, the grandfather of one present-day Arab surgeon being credited with having replaced, by means of a cap of plaited halfa grass, enormous quantities of bone which he had removed from a patient's skull, a feat which is supposed to have been rivalled by an old-time Shawiya, who used a piece of camel's skin as his material.

Only one practitioner has told me of any restrictions imposed upon the diet of a person who has been trepanned. This man states that the patient may eat meat, honey, and butter, but must avoid pepper, vinegar, potatoes, turnips, lemons, and eggs.

Such is the operation of the trepan as described by the various native practitioners with whom I discussed it. All agree as to the comparative lack of danger which accompanies it, and all declare that it causes little or no suffering to the patient owing to the extreme delicacy of touch with which they claim to work, one of those who take the longest time over the operation stating that the gradual method he adopts reduces to a minimum the pain inflicted: he further declares that the operation of removing bone from the skull relieves the pain of the injury as pain is instantly relieved by the removal of a thorn from the flesh, and at once restores consciousness to a patient who is unconscious when the operation is commenced.

I need scarcely enumerate all the instances of successful trepanning which have come under my notice in the Aures,

for according to Doctors Malbot & Verneau ' tous ces faits sont en Algérie pure banalité ', but I will cite one case, the first with which I was made acquainted.

In the early spring of 1913, I was taken by a nomad Arab surgeon at the foot of the hills to see a boy of about fourteen years of age, who, in addition to a fractured tibia, had sustained a violent blow upon the left side of the crown of his head. The tibia had been set and some bone had so recently been removed from his skull that I was able to observe the edge of bone cleft by the saw upon one side of the hole, over which the scalp had not yet re-formed. One year later I met the lad, in apparently perfect health, and I collected for the Pitt-Rivers Museum the piece of bone which had been removed from his skull (Pl. V, *o*).

In a Moslem community, in which the desecration of a grave is regarded with the greatest repugnance, I could scarcely expect that any native would procure for me a skull bearing the scar of the trepan. Indeed had I so much as suggested it, my general ethnographical work would have come abruptly to an end, so unpopular should I have become. A European, however, presented me with a skull which had been found at the foot of the Aures massif during road-repairing operations at a point some twelve kilometres to the south-west of El Qantara on the high road to Biskra. This skull (Pl. III, *b*) appears to have been trepanned and shows signs that the patient lived, but for a short time only, after the operation. I was, however, unable to obtain any further information relating to it.

Removal of Bone from Limbs.

Injuries to bone in the limbs resulting from wounds inflicted by muzzle-loading fire-arms charged with any sort of projectile which may be handy, such as scrap-iron and stones, are certain to be numerous among a hot-tempered people by whom the blood feud is still regarded as an almost sacred heritage; and, as we have seen, they not infrequently afford the Shawiya or Arab surgeon an opportunity of adding to his laurels at the expense of the French medical

authorities in administrative centres or garrison towns, when the latter find amputation to be necessary.

Such wounds frequently necessitate the removal of damaged bone from limbs. The required incision is made with an ordinary native knife, which, according to one practitioner, is used cold 'should the patient not object to losing blood', or hot, should he 'object to doing so'. A special cutting instrument with three edges is also used hot by one surgeon for this purpose, as well as for the removal of the scalp in trepanning (Pl. IV, *g*).

The incision made, and the surrounding tissues drawn aside by means of retractors or springs such as are used for the scalp, the surface of the bone is explored with the aid of a fine spoon-shaped probe (Pl. VIII, *h, j, s*), and detached fragments of bone are removed by means of tweezers (Pl. VIII, *n*).

According to one surgeon, a saw should not be used to separate pieces of bone which it is desired to remove from a limb, but this should be done with European scissors or with a knife; other practitioners, however, employ their trepanning saws for this purpose, and one used a saw specially made for it. This instrument, which I collected (Pl. VIII, *m*), consists of a rectangular bar of iron, eight inches in length, of which five and a quarter inches are flattened to form the blade. Three and a quarter inches at the distal end of this blade are serrated with fairly fine teeth. The saw is not fitted with a wooden handle. A typical case of the successful removal of bone from a limb without the insertion of anything to take its place is one which I observed in March 1914.

The patient, a man, had been severely injured three months before by a gunshot wound in the right leg, the doctor having removed considerable quantities of bone from the tibia so that the man had no other support when standing than that afforded by the fibula. When I saw him his leg was much swollen, and he was still undergoing treatment, which consisted in dressing the nearly healed wound with a mixture of *olive oil* and the surgeon's *saliva*, upon which some powdered leaves of *Juniperus phoenicea* were sprinkled before a bandage was applied.

The surgeon told his patient that he must avoid cold, and must not yet stand upon his injured leg (which he did in order to demonstrate the success of the surgeon's handiwork), because by so doing he would cause the blood to flow too freely into the limb. He further stated that the patient would be permanently lame. The surgeon regarded this case with exceptional pride and satisfaction, for, he said, the patient had in the first instance been taken to a European practitioner, who had declared amputation of the limb to be necessary. I have noted many examples of the successful removal of bone from limbs, and have sent to the Pitt-Rivers Museum several fragments thus taken away from persons whom I have met when cured; for example, the piece of a tibia illustrated (Pl. VIII, *q*).

Substitution of Bone in Limbs.

In the case referred to above nothing was substituted for the bone removed from the patient's tibia, in which a gap had been created. The reason for this is that nearly all the surgeons I met with were agreed that the replacement of bone by any foreign material can only be effected where the injured bone is well surrounded by tissues which would retain that material in position, and that nothing can, accordingly, be done to replace a fragment removed from the tibia. There is, however, on record a well-authenticated case of an orderly in the employ of the French who, when a boy, sustained so severe a fracture of the tibia that a piece of bone 'came out', and was replaced by a fragment from the leg of a sheep, inserted by the lad's father; the limb being thus rendered perfectly strong and serviceable.

The substitution of animal bone for bone damaged by gunshot wounds in other parts of the body is by no means rare, and has been successfully performed by several of the native practitioners I have met. I have myself observed many natives upon whom the operation has been performed, among them an elderly sheykh whose arm had been shattered by a pistol-shot some years before, but which had been completely restored by the insertion of a fragment cut from the leg of a dog after, as the successful operator was careful to

point out, amputation had been pronounced by a European to be necessary.

Most surgeons believe that the bone of a dog is the most suitable material for replacement, but that of a sheep is considered to be nearly as good, while one practitioner advises the use of porcupine's bone. There may, perhaps, be some now-forgotten magical reason for the use of the last-named substance, for the right fore-foot of the porcupine, set in silver, is very generally worn by nursing mothers both in the desert and the hills for the cure and prevention of sore breasts.

Having removed the damaged bone and trimmed the edges of that left in the limb, the surgeon carefully cuts to the required length a piece of bone from a freshly killed dog (the local animal is about the size of a small collie), and so shapes its ends that it will fit neatly into the gap made in the patient's bone. He then places it in position in the limb and applies bandages and splints, the substituted bone being held in place by the surrounding tissues alone, no attempt at wiring it to the human bone being made. Such an operation, in the case of an elderly man, should result in a cure in from two to two and a half months.

Fractures in Limbs.

In the case of a simple fracture of, for example, the tibia, after the bone has been set, a little *butter* which, in the opinion of some surgeons, should be devoid of salt, is lightly rubbed over the seat of the injury, and some *wheat flour* is sprinkled thereon. One surgeon, however, held that butter should be applied to the head only, *oil* being more suitable for the limbs, while another advises a poultice of equal parts of *barley flour* and the powdered leaves of *Passerina hirsuta*, L., instead of the dressing of butter or oil, the poultice remaining in position until the seventh day after its application.

The limb having been bandaged with strips of cotton material, over which a layer of sheep's wool is sometimes placed, splints are applied. These vary in form. One practitioner applies four straight flat pieces of any wood which may be at hand, one to the front, one to the back, and one to

each side of the limb, retaining them in position by means of cotton bandages, and firmly lashing the foot in a natural posture to a piece of board which is fixed to the wall, if the patient resides in a house, or which is driven as a peg into the ground in the case of an injured tent dweller (Pl. VI, *a*). In the opinion of this surgeon swelling of the foot is an indication that knitting is progressing favourably, while swelling above the seat of the injury shows that the reverse is the case.

Another surgeon keeps by him specially prepared splints, four in number, of the hard wood of the local juniper hewn in a slight curve to fit the limb with an adze, a relic in form of the Bronze Age. The two pieces destined to support the sides of the limb are broad, that for the front surface narrow and shorter than the rest, while the back splint is slightly longer than the others, and is carved into a fork at one end to enclose the heel (Pl. VI, *b*). All four pieces are connected by two cords of twisted goat's hair, each cord being passed through a pair of holes near each end of the side splints, and tied around the back and front pieces; these cords are used for securing the splints upon the limb.

It appears that a development of this ready-made contrivance may be found in the 'jebira' (bag) splint, much favoured by many practitioners, and applied to the tibia, as well as, perhaps more generally, to the arm. This consists of a combination of splints and bandage held in place by two or three tourniquets.

The simplest specimen I collected is composed of a strip of white French canvas upon which are sewn with twine six flat pieces of white wood, each about seven inches long, and from one inch to one and a quarter inches in width, placed parallel to one another at intervals of from one to one and three-quarter inches. The edges of the strip of canvas are folded back over the ends of the wooden splints and sewn down with twine. Two projecting flaps at one side of the canvas are passed through two slits in the opposite side, when the splint is placed upon the limb, to retain it temporarily in position while the tourniquets are applied. These consist of two small oblong pieces of wood cut from a thin

branch of a tree, perforated throughout their length, and two loops of twine. The loops are placed around the limb, one over each end of the splint, and the pieces of wood inserted through them, the latter being then twisted in opposite directions until a sufficient pressure has been attained, when a stick, thrust through the perforations in both pieces of wood, firmly locks the tourniquets in position. The splint can thus be tightened or its pressure relaxed, as swelling decreases or increases, without removing it from the injured limb, by merely twisting the tourniquets as required and re-locking them with the stick.

I collected two other specimens of this 'jebira' splint, in which the six flat pieces of wood are replaced in one case by seven and in the other by eight strips of split bamboo, stitched to goat-skin; two pieces of bamboo from two to three inches long serving to twist the cords which hold each in position.

In the most elaborate form of 'jebira' of which I obtained examples the place of the pieces of wood or split bamboo is taken by strips of stiffly plaited halfa-grass, sixteen in number, $7\frac{1}{2}$ inches in length and $\frac{5}{8}$ of an inch wide, sewn parallel and almost contiguously to one another upon a piece of roughly tanned goat-skin, the edges of which are folded back to cover their ends and also the sides of the two external strips. Each strip is neatly covered with plaited white cotton fabric. Three tourniquets, consisting of loops of goat's-hair cord and pieces of bamboo, locked by means of a stick passed through the bamboos, retain the appliance in position.

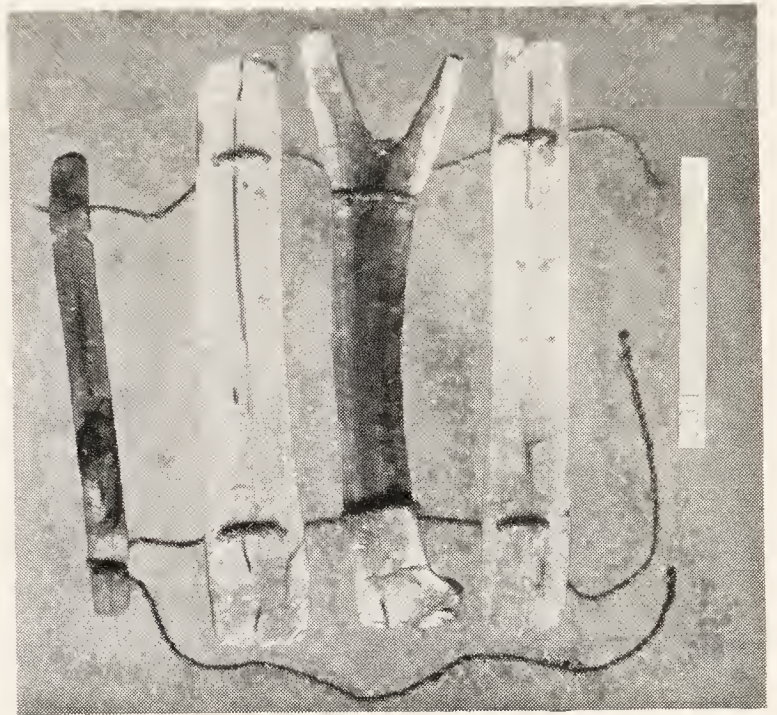
This ever ready and easily adjusted splint (Pl. VI, *c*, *d*) is of considerable rigidity owing to the density of the plaiting of its halfa-grass strips, but is not so unyielding as those of wood or split bamboo. Wood is preferred to plaited halfa-grass in cases of fractured thighs. Cotton material is wrapped around the injured limb before the application of the 'jebira' splint. In cases in which splinters have become detached from the bone by the injury this splint is considered to be especially useful, as the pressure it exerts upon the limb causes the fragments to force their way out through the skin which, when necessary, is cut to facilitate their passage. I have observed several instances of the 'jebira' in use for

a



STRAIGHT SPLINTS WITH PEG

b



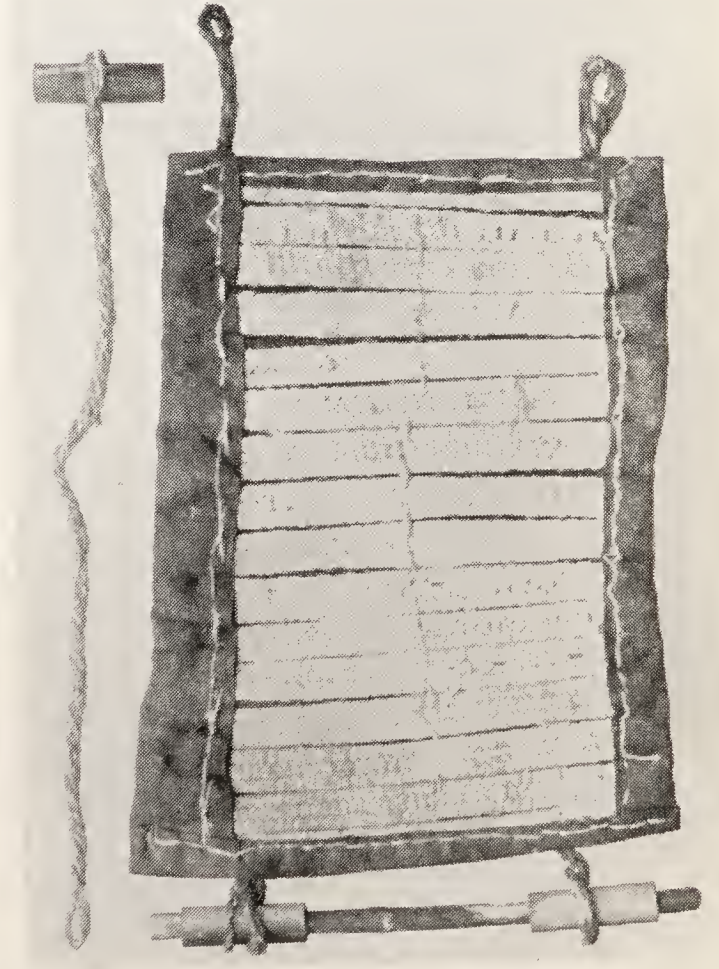
CURVED SPLINTS FOR TIBIA

c



METHOD OF SECURING THE 'JEBIRA'

d



THE 'JEBIRA' SPLINT

a fractured upper arm. In such cases the surgeon places a pad, often consisting of a kid's skin stuffed with wool or bran, in the arm-pit, and supports the forearm by means of a sling. This is done in order to 'prevent the shoulder from drooping'.

Should the fracture of the limb have been caused by a bullet, holes are cut in the 'jebira' to coincide with the entrance and exit holes of the missile, in order that these may be dressed without the removal of the splint.

Fractures of limbs are necessarily frequent in a rugged mountainous country such as the Aures, in which a large portion of the male population is occupied with the herding of goats upon precipitous rocky hill-sides, and the work of the Arab and Shawiya surgeons in dealing with these injuries seems to be remarkably successful. One practitioner, however, informed me that, when suffering from an attack of fever, he had so badly placed the hand of a girl, a bone in whose forearm he had set, that he had been obliged to re-break the bone some time later and set the limb afresh.

In 1919 I witnessed the following remarkable treatment of an injury to the knee which, brutal though it was, was carried out by a surgeon well known over a great extent of country as a highly successful performer of trepanning and the substitution of bone in limbs.

The patient, a man of about thirty years of age, had fallen upon a cliff-face when tending goats, and had sustained, according to the surgeon, a transverse fracture of the knee-cap, the upper portion of which had been drawn up by muscular contraction and required to be restored to its normal position. The knee was considerably swollen. The surgeon carefully measured the distance between the summit of the knee-cap and the ankle in both legs, and, having failed to force the injured bone downwards by means of great pressure exerted by his thumbs, then laid the round wooden handle of an instrument above the bone and struck this handle several hard blows with a hammer. This performance was repeated three times, after which a re-measurement of the limbs seemed to indicate a satisfactory position of the knee-cap, and bandages were applied above and below the knee. These bandages

were connected by strips of rag at each side of the knee to prevent their displacement, the knee-cap itself being left uncovered. A red-hot disk-headed cautery, resembling a large 'French' nail (Plate VII, *a*), was then applied in light touches to the skin over the knee-cap, some hot *cedar-pitch* was smeared upon the cauterized surface, and a pad consisting of foul wool, cut specially from the hind quarters of a sheep for the purpose, was bound over the injured knee.

The patient, who was held down by four assistants, groaned and endeavoured to writhe while the pressing and hammering were in progress, and appeared to be on the verge of losing consciousness, but no sooner was the bandaging of his knee complete than he partook of a hearty meal and commenced to discuss with me, as if nothing unusual had happened to him, some point connected with a hand-loom near by in which I was interested.

The surgeon, on our way from the house, told me that the patient would always be lame. A year later, when revisiting the surgeon, I inquired after this Spartan patient, and was told that he had recovered but was slightly lame, the doctor remarking that he was now of the opinion that the knee-cap had been dislocated but not fractured.

It appears, from inquiries made relative to this case, that the natives do not attempt to wire together surfaces of bone separated by fracture.

Fractures of the Collar-bone and Ribs.

A fracture of the collar-bone, which is regarded as a serious injury, having been set, is treated by the application of cautery in a series of dots upon the skin along the course of the bone.

Cautery is similarly used in the treatment of a fractured rib, for which one practitioner recommended the application of a paste composed of a coffee-cupful of *wheat flour*, some *salt*, and *eggs* up to the number of seven (a magical number). This paste is said to cause the ends of the bone to knit. It is curious that the same surgeon who insisted upon the absence of salt from the butter smeared upon a fractured

tibia, should recommend its inclusion in the dressing for a broken rib.

Should a fractured rib be depressed, one of my native surgeon friends states that it should be drawn back into its natural position by means of suction applied with the aid of an ordinary tin bleeding cup (Pl. VIII, *r*), which operation he naïvely described as very exhausting for the doctor. Bandages should be only fairly tightly applied to a fractured rib.

Fracture of the Jaw.

Nothing can be inserted to replace shattered bone in the jaw, and, as a rule, no splint is applied when this is fractured. One surgeon informed me, however, that he had applied a curved wooden splint beneath a jaw, both sides of which had been broken, securing the splint by means of bandages passing over the top of the head; the patient, who was fed entirely upon milk, recovering in three weeks.

Another practitioner, before bandaging a simple fracture of the jaw, applies an ointment of *honey* and *butter*, upon which some powdered *gallnut* is subsequently sprinkled, and later applies either, (*a*) powdered *linseed* boiled in *milk*, with which it forms a paste; or (*b*) a similar paste made of *milk* and the powdered leaves of *mallow* (*Malva sylvestris*, L.), or (*c*) a paste consisting of old crushed *dates*, from which the stones have been removed. These three pastes are considered equally useful.

In 1921 I observed a case in which a large piece of bone had been removed from the jaw by a Shawiya surgeon, the patient being a man of about forty years of age (Pl. II, *d*).

A bullet had entered the jaw-bone on the right side about three-quarters of an inch from the point of the jaw, and had passed out on the left side about one inch from the point; it had then pierced the inner side of the left arm. The patient's lower jaw had been fractured and so shattered that a fragment measuring, on the inner curve, one and a quarter inches in length with a maximum depth of half an inch, had been removed with the aid of a pair of European scissors (Pl. VIII, *p*). The two ends of the jaw-bones, left separate by the fracture, were drawn together by means of bandages, and

when I felt the interior of the patient's mouth, two months after he had received his injury, they seemed to have knit remarkably well. Owing to the loss of his lower front teeth, the sockets of four of which were included in the bone removed, the man was able only to partake of soft food, but his face showed no disfigurement whatever, the entry and exit holes of the bullet being concealed by a small stubbly beard. Indeed, I sat beside the patient in a coffee-house for some considerable time before I became aware that I was in the presence of the injured man I had been brought to interview.

The bullet which had rendered necessary this operation also inflicted considerable damage upon the patient's left arm, causing much suppuration, and, according to the surgeon, severing a vein, as a result of which the third and fourth fingers of the hand became dark in colour and immovable. Regarding these fingers as dead the surgeon cut them off, no objection being raised to the removal of a dead member, performing this operation in a very crude manner by cutting straight through their middle joints without leaving any flap of skin to cover the bones left in the hand. The stumps had not healed when I saw the patient.

Dislocation and Muscular Injuries.

Dislocations are regarded by one surgeon, who enjoys a great reputation for his skill in their reduction, as more serious than the fracture of bone in a limb. The hip-joint can be dislocated in four different directions, the position of the foot indicating in which direction it has taken place. The foot is pulled out straight and hard to allow of reduction.

Dislocation of the wrist having been reduced by pulling strongly at the hand, the limb is put into splints, and cautery is applied over the joint. A displaced knee-cap is worked back into position by hand, the limb having been coated with oil. Poultices of fresh *cow's dung* and *salt* are applied hot to the part affected after a dislocation has been reduced.

One of the most noted surgeons I met with informed me that muscle cannot be broken, the symptoms usually attributed to this cause being in reality due to the displacement of a portion of the flesh. The remedy which he suggests for this

is one which is regarded by Arab and Shawiya alike as a panacea for nearly all the ills that flesh is heir to, namely a hot bath followed by massage at a 'hammam', or bath-house, to be found in every large centre such as Batna or Biskra, but of which few villages in the Aures can boast.

The attendants at the 'hammam' are accustomed to massage their patrons with some skill, but with a roughness which renders the treatment extremely trying to a European. Where this treatment is impossible cautery is resorted to. Other practitioners, however, declare that muscle can be broken.

For contracted muscles in the hand some surgeons make incisions with the knife in the palm and on the inside of the fingers in order to produce relaxation, while one aged doctor told me that for muscular contraction of the elbow he weights the hand with a stone, and for a similar affection of the knee he attaches heavy stones to the feet and causes the patient to ride a donkey as much as possible, so that the weight of the stones may extend the limbs.

A native friend of mine, now well past middle life, had been recommended by a surgeon to enclose each of his fingers in the hollow of a reed for a period of fifteen days, in order to straighten their top joints, which had been bent for a considerable time. The surgeon did not suggest any cutting of the muscles before commencing this treatment.

In the case of fluid forming around a joint which has been severely wrenched, an incision is made with a knife to allow the fluid to escape. One of the camel drivers I employed some seventeen years ago when travelling in the Sahara, had opened his own knee with a red-hot knife for this purpose. Sprains, in which no fluid forms, are treated by lightly touching the skin around the part affected with a red-hot pointed instrument, of which several types are in use (Pl. VII, *b, h, j*).

Among the commonly employed folk-remedies for sprains and bruises I found that poultices of *mule's dung* and *salt* are applied to a sprained ankle; a rag, containing a little *salt*, is dipped into very hot *olive oil* and 'dabbed' upon a twisted

knee ; and *camel's fat*, wrapped in rag, is warmed over a fire and gently rubbed upon the part wrenched or bruised.

The use of camel's fat was recommended to me, with beneficial effect, when I had severely bruised my knee in falling from a mule in the higher northern portion of the Aures massif, a region in which the camel is not to be found ; an instance, perhaps, of the rarity of the material increasing its value in the opinion of the native, who could more easily have obtained the fat of several other animals, such as the goat, the sheep, or even the mule.

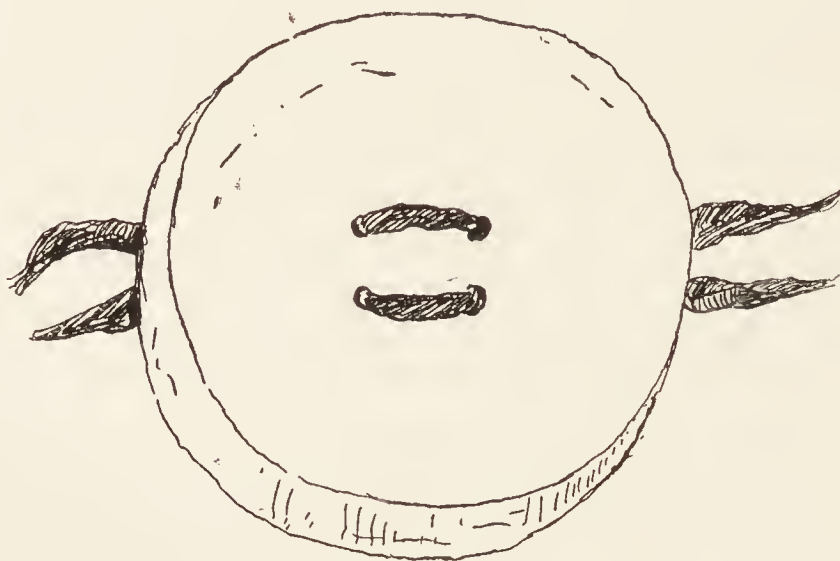


FIG. 9.

Hernia.

Infantile umbilical rupture caused by excessive crying after circumcision, is prevented by binding over the navel, by means of cotton rags, the circular wooden head of a spindle whorl, some two and a half inches in diameter, or a plaster disk, three inches in diameter, made of powdered limestone, to be found in many districts (Fig. 9).

This rupture, of which diarrhoea is a symptom, is also commonly caused by the shock produced by jumping from a height, and is known as 'fallen navel', for the navel is believed to 'drop inside the body'. In order to restore it to its proper position *oil* is rubbed upon the skin, and a bowl containing a piece of lighted paper is pressed tightly over the 'navel', which is drawn up into position by the suction caused by the vacuum produced by the burning paper in the

bowl, a treatment which recalls the use of the 'cupping glass' of modern times.

Rupture in adults appears to be treated by cautery alone, no surgeon I have met with having ever applied a truss to a grown-up person.

Cautery.

I have already mentioned the use of cautery in the treatment of several injuries; it is, indeed, a first favourite among the Shawiya and the Arabs for almost every conceivable ailment, laymen often applying it to themselves or to their friends without calling in the doctor. Almost any piece of iron, heated in the fire, serves for its application, but there are various forms of special instruments in use by the surgeons.

In cases of twisted joints a pointed instrument (Pl. VII, *b, h, j*) is applied in light quick touches around the injured part; flat rectangular cauteries (Pl. VIII, *f*) are similarly applied to the abdomen, as are others in which a disk at the distal end (Pl. VII, *a*) recalls the appearance of a large 'French nail' (I have seen such a nail fitted into a wooden handle for the purpose); while some sores and suppurating wounds are treated by means of a searing cautery (Pl. VII, *k*) closely resembling, in miniature, the sickle-hook of the country, from which, indeed, it may well have derived its shape, for General Daumas, in his *Horses of the Sahara*,¹ states that the sickle itself is used for 'firing' these animals, and I have seen a broken sickle which was used in applying cautery to human beings.

For the cautery so much esteemed as a remedy for disorders of the spleen, an instrument is used (Pl. VII, *j*) in which twin or triple points are turned at right angles to the rest of the blade, the twin-pointed variety resembling in form the flesh-hook of the Aures, which may itself have served the purpose in the past, and suggested the shape of the special instrument now employed. In applying cautery to the side over the spleen the skin should be raised by an assistant in order that the heat may not damage the internal organs.

For mild cautery in cases of splenic trouble in infants, a

¹ Translation by James Hutton, p. 76.

short wooden spike (Pl. VII, *g*), used in the manufacture of halfa-grass sandals, is lightly applied to the skin after being heated by fire, and not by friction, as Burckhardt states that a cautery made of oak was heated by the nomad tribes of Arabia. In this practice I found no trace of the use of boiling oil which Hippocrates applied by means of a box-wood spindle, and Aetius with the aid of a root of birthwort,¹ but in the use of the sandal-maker's wooden spike and in the application of cautery for rheumatism with the aid of a heated root of *Thapsia garganica* (a treatment used in the desert) we may perhaps find survivals of these methods.

One surgeon of the hills recommends for 'swollen hands or feet' a treatment in which *pine pitch* is smeared over the part affected, and a red-hot iron is passed three times over the surface thus prepared, without, however, touching it.

Abscesses are frequently opened by means of a red-hot instrument fitted with a rectangular blade, one edge of which is sharpened (Pl. VII, *c*), or with twin curved points (Pl. VII, *f*), or in which the distal end is curved and hollowed as in a carpenter's gouge (Pl. VII, *d*); a flat strip of brass, heated over a fire, is also used for this purpose, as is a flat iron spike, pointed at one end and square at the other; either end being used as required.

In addition to its surgical uses cautery is also employed, as Monsieur Edmond Doutté points out,² in the magical operations directed against the Evil Eye in various districts of Barbary, and was apparently so used in Arabia at the time of the Prophet Mohammed.

Surgery of the Eye.

Affections of the eye are very common in Algeria, owing not only to the dust and glare of the desert and the barren rocky hills, but also, no doubt, to the unpleasant habit of removing a foreign body from a friend's eye by licking the eyeball with the tongue, which is much practised by the natives, and has been noted by Dr. Leared in Morocco.³ We

¹ Milne, *Surgical Instruments in Greek and Roman Times*, p. 120.

² *Magie et Religion dans l'Afrique du Nord*, p. 324.

³ *Morocco and the Moors*, p. 279.



CAUTERIES



DENTAL AND OPHTHALMIC INSTRUMENTS

have already seen that a number of the doctors to be found in the Aures and the desert specialize in the treatment of these affections, in the course of which they sometimes resort to surgical operations. When a white film, which is remarkably prevalent, forms over the eyeball, proceeding from the corner nearest to the nose, it is treated before the operation for its removal by the application of a powder prepared in the following manner. Some fluid extracted by pounding in a mortar the leaves of *Lycium Europaeum* is placed in an empty egg-shell, the opening in which is closed with dough. The shell is then imbedded in a dish of semolina, which is 'steamed', in the manner usual for the preparation of the Algerian national dish known as 'Kuskus'. After remaining in the semolina all night the extract within the shell will be found to have solidified; it is then dried in the sun, and pounded into powder for application to the eye.

The doctor who recommended this treatment did not give me any reason for its use. The film, now ready for removal, is carefully lifted by means of a small and very sharp-pointed hook and 'skinned' away towards the corner nearest to the nose, where it is snipped off with scissors, some wool dipped in *oil* containing *salt* being applied to the part to check haemorrhage.

The hooks used (Pl. VII, *n, o, p, q, r*) vary in length from two to five inches, and are made of strong iron or brass wire, or of a flat narrow strip of copper, or, rarely, of silver, the distal end being sharply pointed and bent back to form a hook, and the 'handle' end usually curved into the form of a ring.

All the scissors I have seen in the hands of Algerian surgeons have been of European manufacture; the very old locally made pair of which I give an illustration (Pl. VII, *u*) having been handed down from an unknown date in the family of the practitioner who gave it to me. It is now blunt, rusted, and quite useless.

After the removal of the film, a powder, rendered as fine as possible by being passed through a piece of rag, *and* consisting of equal parts of *saltpetre*, *alum*, *saffron*, and *eggshell*, is introduced into the eye, the surgeon blowing it from a large quill.

The eye is then covered with a bandage for eight or ten days, after which it will be found to be cured.

Should the film over the eyeball be very large it is scratched a little with the point of a knife (one surgeon uses a small flat strip of iron, both ends of which are ground into rounded cutting edges) (Pl. VII, *s*), and a powder composed of exactly equal parts of *ostrich-egg-shell*, *pearls*, *coral*, and the baked body of a *scorpion*, having been strained through a rag, is introduced into the incision made with the knife. After a time the film turns black, when it is daily bathed with a lotion consisting of a little powdered *saffron* mixed in *rose water*, used warm in winter and cold in summer; the film over the eye disappearing after about a month of daily bathing.

The surgeon who described this treatment to me naïvely remarked that it was very expensive, and it seems to me to be suggestive of medical magic derived from some ancient book, for coral and scorpions are largely used to combat the machinations of demons in Algeria; it is, nevertheless, a fact, that all the ingredients used for the powder can be obtained in Barbary.

Another practitioner employs a different method for the removal of film which wholly or partially obscures the vision, and which he described as 'a sort of skin appearing to contain fluid'. He inserts laterally behind the film, from the outer side of the eye, a thin brass spike, the point of which is fairly sharp, and then twists the spike round and round so that it rolls up the film until the lower eyelid is reached, when the film is cut away. The instrument is made entirely of brass, its spike being about three-quarters of an inch in length (Pl. VII, *t*). This surgeon, a native of Morocco, enjoys a very wide reputation as an oculist in the Aures, the country of his adoption, patients coming to his village from a very large area to undergo treatment at his hands, and there is little doubt that he has proved remarkably successful in removing film from the eyes of many.

This film is also treated in some cases without recourse to an operation, one of the following substances being blown, in powdered form, into the eye from a quill: *pearls* (only in cases in which the film is not believed to have been caused

by contact with small-pox pustules); *chicken-* or *ostrich-egg-shell*; or a mixture of five parts of burned and powdered *camel's flesh* and one part of *human hair*, pounded together in a mortar; or of *burned iron*, *saffron*, *acetate of copper*, *catkin of Piper longum*, and *white sugar candy*, of which latter mixture as much as will cover a penny piece is blown from the quill at one time.

The following lotions are also recommended by various practitioners for the treatment of the same affection; powdered *saffron* and *white sugar candy* mixed with the *milk* of a *woman*; the extract obtained by pounding in a stone mortar the fresh soft red root of *Zizyphus lotus*, Willd., (applied drop by drop in incipient cases); or *rose water* in which have been bottled two or three small multipede insects to be found in water, of which I have hitherto failed to acquire a specimen.

For inflammation of the eye some surgeons draw off blood by means of incisions made in the inner membrane of the eyelid, arresting the haemorrhage, when sufficient has been allowed to flow, by the application of *olive oil*. Others recommend the application of a cold compress of rag soaked in the *milk* of a *woman*; or of powdered *white sugar candy* dissolved in a mixture of *rose water* and *milk*; or of powdered *sugar candy*, *saffron* and *rose water*; or of a very little *alum*, some *white of egg*, *olive oil* and *vinegar* mixed in equal parts.

The crushed leaves of *Sonchus maritimus*, L., are also applied to the eye to 'draw out the inflammation', as is the *skin* of a *viper* boiled in *olive oil*, the latter treatment doubtless emanating from the universal belief in viper's skin as a defensive weapon against the attacks of demons.

Various liquids are applied drop by drop to the eye for inflammation, among them being the extract of pounded fresh leaves of *Beta vulgaris*, L., squeezed into the eye from the gall-bladder of a jackal, or of either the Dorcas or Cuvier's gazelle (the method of its application doubtless arising from the common magical use of a gall-bladder and from an idea of sympathetic magic, the eyes of the gazelle being much admired by the poets of the desert and the hills). The extract of pounded leaves of *Marrubium supinum*, L., or of a species of *Pimpinella* (resembling a small wild variety of celery); or

the fluid from the capsules of *Solanum nigrum*, L., var. *villosum* ('houndberry', known to the Shawiya and the Arabs as 'grapes of the jackal') are similarly introduced for inflammation, but without the aid of a gall-bladder.

For eyes which tend to 'weep' a mixture of equal parts of the seeds of cotton, seeds of quince, and the white pith from the nodes of bamboo, is warmed and introduced into the eye, being considered also a useful remedy for 'stye', while blood from the freshly cut throat of a hoopoe is employed for the same purpose, a further example of the persistence in use of magical substances among the oculists of the Aures.

A drooping upper lid of the eye is shortened by a small operation. Two of the sharp hooks used in the removal of film are inserted one at each end of the lid, so that the point



FIG. 10.

of each hook protrudes from the skin, having pierced the eyelid twice; the little lateral ridge of skin thus drawn up on the eyelid is then clipped away with scissors or carefully slit with a sharp knife, and the edges of the slit so made are stitched together with horse-hair or silk, a daily dressing of the *antimony*, used by the women of the Aures to darken their eyelids and eyebrows, being applied until the slit is healed.

In another method of shortening the eyelid the skin is not cut, but the ridge picked up by the hooks is stitched with silk or horse-hair to form a 'reef', this reef being then clamped by means of a minute cane-splint, slit down the centre, and bound at each end with cotton (Fig. 10). A dressing of *antimony* is applied daily for four days, and upon the eighth day the splint falls away, leaving the eyelid shortened by the healing of the perforations made for the stitches.

Dropsy (Surgical Treatment).

Although James Richardson, who visited Ghadames in Fezzan in 1845, states in his *Travels in the Great Desert of*

the Sahara, i, 323, that there 'in dropsy the native doctors cut the body to let out the water, as we do', I have found no example of this treatment in and around the Aures.

Setons, however, are employed in its treatment by both Arab and Shawiya. The symptoms recognized are constant thirst and the distension of the abdomen by fluid. One doctor considers cold to be the cause of the disease, which is known as 'saqya', from a verb-root signifying 'to water' (a root whence also springs the word 'saqiya', irrigation canal).

In 1914 I witnessed the introduction of setons as a remedy for dropsy in a remote hamlet of the Aures. The surgeon first reduced to powder in a brass mortar some *acetate of copper*, which he then mixed with three coffee-spoonfuls of *honey* and a very little water, subsequently melting the mixture over the flame of a small European lamp. In this mixture were steeped the setons, consisting of three strips of old and dirty red cotton dress-material. The patient lying upon his back, an assistant proceeded to pinch up with the forefinger and thumb of each hand, a ridge of skin, some two-thirds of an inch in height, transversely across the body an inch above the navel, beside which ridge (on the side farthest from the navel) he laid a flat strip of copper. The surgeon then thrust a red-hot pointed iron instrument through the ridge of skin immediately above the navel, making the incision from the side on which the strip of copper protected the surrounding skin from contact with the red-hot iron.

The instruments used for the perforation of the skin are straight (Pl. VIII, *b, g*), or curved (Pl. VIII, *a*), a curved instrument resembling a coarse packing-needle (Pl. VIII, *e*) perforated with an eye at its blunt end, sometimes serving also to introduce the setons into the holes made by its point. One of the setons was then passed through the hole so made with the aid of a coarse copper needle (Pl. VIII, *c*), two similar setons being subsequently introduced, one on each side of the first and about two inches from it. The ends of the setons were left hanging loose, but another surgeon told me that he usually knots the ends of each one together to prevent their accidental withdrawal. At subsequent visits

the setons are drawn up and down to facilitate the exodus of the fluid, of which as much as a litre is said to be so drawn off.

Although in the case described only three setons were inserted, another surgeon recommends four, while a third advises six, introduced in the lines of three each, one line above the navel and one below it. It is said that the setons are not removed, but are left in place until the 'skin falls apart', when they come away by themselves.

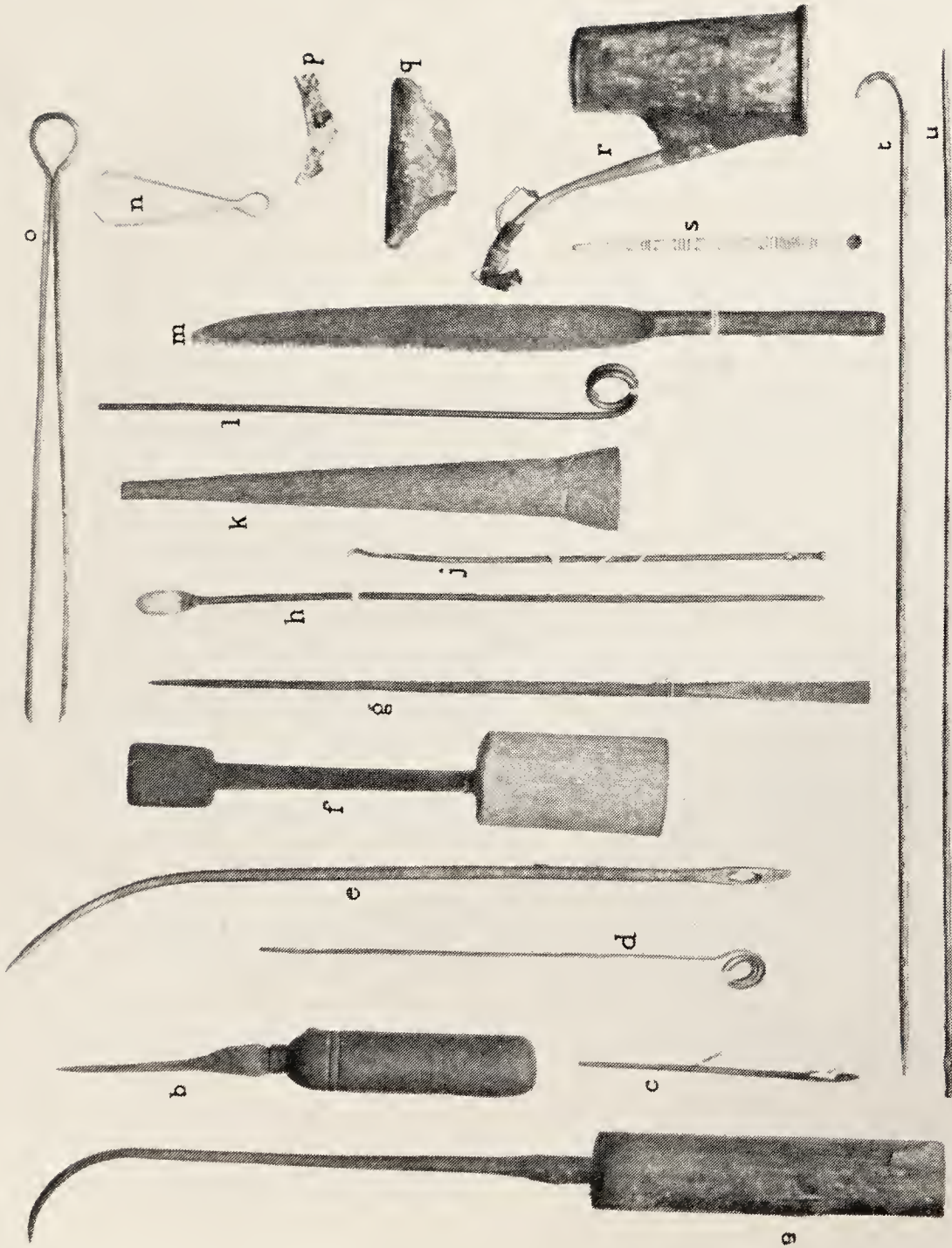
After the setons had been inserted in the case I witnessed in 1914 some cold pitch of *Juniperus phoenicea* was smeared upon the skin around them and over the abdomen, and cautery was applied in light quick stabs by means of a red-hot instrument with a flat rectangular iron blade (Pl. VIII, *f*) all over the area treated with pitch, some powdered *henna* (leaves of *Lawsonia inermis*) was sprinkled freely over the burns, and the patient's body was covered with a piece of old cotton dress-material, retained in position by means of strips of the same stuff. The patient did not exhibit the slightest sign of suffering during the perforation of his skin by the red-hot instrument and the introduction of the setons; he groaned and flinched a little, however, during the subsequent application of cautery.

Some notes upon the medicinal treatment of dropsy will be found under that heading in the final section of this book.

Obstetric Surgery.

Delivery is usually so easy that professional assistance is rarely required. The newly-born child is not immediately washed, but the umbilical cord is dressed with *antimony*, and the child swathed in clothing. In the case of skilled assistance being rendered necessary by the position of the child, the doctor oils his hand and arranges the child into a natural position. In the event of this being impossible living children are, very rarely, dismembered and removed, as are those who die before birth, in the following manner.

The surgeon oils his hand and lays the flat side of the blade of a sharp native knife along his extended forefinger, so as to keep its edge from inflicting damage until it is required to be used. In this position he inserts his hand,



MISCELLANEOUS INSTRUMENTS

turning the blade of the knife so that it lies edge-upwards, with its back along his finger, when he is ready to commence dissection. The portions of the child thus dismembered are removed with the aid of iron hooks. After the operation one practitioner asserts that an infusion of *melon flowers* should be drunk by the patient for cleansing purposes and as an aid to urination.

It appears that this operation is very rarely performed upon human beings; but one or two of my surgeon friends state that they have successfully carried it out upon animals.

I have never met with a native who claimed any practical knowledge of the Caesarean operation, although one surgeon informed me that he had read of it in an old book.

Lithotomy.

When 'little stones like shot hinder urination', half a coffee-spoonful of the following mixture is taken morning and evening: one part of powdered leaves of *Mentha rotundifolia*, L., three parts of *honey*, and one-half of an imported *cantharide beetle* (known in Algeria as the 'Fly of India'). This causes dissolution of the stones. If in from twenty-five to thirty days a cure is not effected, the surgeon resorts to lithotomy, which operation, however, appears to be but rarely performed.

The calculi are sought with the finger, which is often inserted in the rectum for this purpose, and when they have been located a small incision is made with the knife to allow of their removal. Sometimes the urethra has to be opened, a long fine probe being inserted into it to provide a surface against which to cut. The incision thus made is immediately sewn up and dressed, the operation causing no permanent hindrance to urination.

Operations upon the penis, other than the universal circumcision of male infants, do not seem to be performed by native surgeons as a rule, injuries thereto being merely dressed. A very aged Shawiya practitioner, however, who at one time enjoyed a very wide reputation as a successful, if brutal, operator, claims to have removed a penis injured by a gunshot wound and replaced it with a reed. The

suspicious and reticent old man would give me no details of the operation, which he stated was the most difficult he had attempted, and had proved completely successful; but the case is remembered by the older men over a wide tract of country in the Aures and the neighbouring desert, and is freely quoted as an example of the old surgeon's remarkable skill.

Circumcision.

In 1920 I was present at the circumcision of two boys in a Shawiya hamlet. The occasion was marked by much dancing and rejoicing on the part of the women of the families concerned and their invited guests, several magical practices being employed to keep away from the patients the 'jenun', or demons, so much dreaded in Algeria. These practices, of which examples are the firing of a gun at the moment when the actual operation is complete, and the subsequent double series of seven rotary movements of an attendant's hand containing salt around the patient's body—the salt being afterwards sprinkled upon his head—are perhaps more suitable for description in a work dealing with folk-lore than in an account of the surgery of the Aures.

The operation itself was quickly and neatly performed, both children being treated in exactly the same manner. The first patient, a child of eleven months, was laid upon a large up-turned circular wooden dish (used in the preparation of unleavened bread), upon which a considerable quantity of powdered earth had been placed to form a couch, and was held by an assistant who supported the child's back with his left hand, and held its feet with his right so that the legs were extended.

The operator, *who was not a practising Shawiya surgeon*, then produced a small stick, some four inches in length, cut so as to leave a knob at one end (Fig. 11). Having drawn back the foreskin, dipping his finger and thumb in the dust of the mud floor to improve his grip, he pressed the knobbed end of the stick against the glans penis and drew the foreskin over the knob on to the stick, to which he secured it with string so that the knob prevented its withdrawal. He then drew a loop of clean woollen thread tightly around the fore-

skin, between the glans and the knob of the stick, and severed the foreskin by one quick downward cut of an ordinary native knife between the knob and the woollen loop, the latter serving to protect the glans.

A slight variation of the operation was described to me by a surgeon, who gave me a stick used as above, in which one end, instead of being knobbed, had been hollowed into a cup-like depression (Fig. 12). In this depression a small round

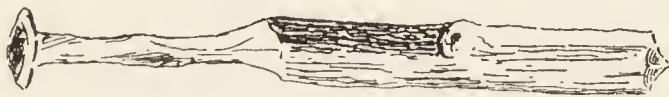


FIG. 11.

pebble is placed, and the foreskin drawn forward and tied to the stick so as to retain the pebble in position between the glans and the end of the stick. The cut is made between the stick and the pebble, which latter protects the glans. This surgeon recommends only a dressing of *antimony* after the cut has been made, but in the two cases I witnessed more elaborate treatment was used.



FIG. 12.

Immediately the foreskin had been severed a raw *egg* was opened at one end and pressed upon the penis, so that the latter was inserted in the egg through the broken shell—it seems just possible in view of the fact that the breaking of an egg by the bride is one of the Shawiya marriage rites, that it may be used in circumcision as an emblem of fertility—and the penis and surrounding parts of the body were liberally besprinkled with the powdered leaves of *Juniperus phoenicea* upon which some melted *butter* was poured. Then some more powdered juniper leaves were sprinkled, followed by powdered *goat's dung*, more melted butter and still more powdered juniper leaves, in the order given. After which the child was enveloped in swaddling clothes, and the opera-

tion was complete. The dried goat's dung may, perhaps, be regarded as a styptic—though it is not applied direct to the wound—for it is used to check haemorrhage after cupping has been resorted to.

Another dressing recommended for use after circumcision consists of a mixture of the powdered *under-bark of pine*, *goat's fat*, and *butter*.

Cupping.

Blood-letting is very frequently carried out, especially in the spring, when the natives consume large quantities of butter-milk, which they believe to produce headache and dizziness. This minor operation is performed by laymen as well as by surgeons, but I have not found any particular class, such as barbers, who specialize in it in the Aures.

The usual method is to make up to six incisions with the knife on each side of the back of the patient's neck and then to apply the bleeding-cup. This locally made instrument (Pl. VIII, *r*) consists of a small tin cup, slightly conical in form, its narrower end closed, the wider one left open. From near the open end rises a curved spout to the extremity of which is tied a small piece of leather. The open end of the cup having been placed over the incisions in the neck, the operator applies suction with his mouth to the end of the spout in order to start the flow of blood into the vacuum thus produced, closing the spout with the piece of leather referred to above, and binding it with string, immediately he withdraws his lips.

I have also seen blood drawn from a vein in the forehead over the left eye without the aid of a cup, the patient's neck having been tightly bandaged with a handkerchief before the incision was made. I have never observed the practice of drawing blood from the arm mentioned by El Bekri¹ as having existed in Fez in the eleventh century of our era.

To counteract the feeling of faintness produced by cupping the patient often drinks coffee without sugar, or eats a lemon, during the operation.

¹ de Slane's translation, 1913 edition, p. 246.

Snake and Scorpion Bites.

For snake-bites in the hands or toes, three incisions with the knife are made in the back of the hand or foot and the bleeding-cup applied in the usual manner, the surgeon placing butter in his mouth before commencing the suction, as a safeguard to himself. Swellings resulting from snake bite are cauterized.

One surgeon is in the habit of opening the part bitten and binding over it the skin of a dog, freshly killed for the purpose, which is believed to withdraw the poison on the principle of a poultice. Should the first dog's skin fail to bring about the desired effect, the treatment is repeated until dogs to the magical number of seven have been killed and their skins employed.

The part bitten by either snake or scorpion is sometimes opened with the knife and the fat of either of the two lizards *Uromastix acanthinurus* or *Varanus griscus* is rubbed into the wound; a mixture of *pitch* and *wheat bran* being similarly rubbed into incisions for the cure of scorpion bites. Persons bitten by snakes or scorpions are caused to drink an infusion of mint (*Mentha rotundifolia*, L.).

Dentistry.

The extraction of teeth is very usually performed by jewelers in the Aures, nearly all of whom possess forceps (Pl. VII, *m*), which contain either two or, more rarely, three 'claws' on either side, and of which one or both sides of the handle are curved to facilitate the grip. I have seen one double specimen, i. e. two forceps which had one bar of their handles in common, such as is illustrated in Dr. Raynaud's *Médecine au Maroc* (p. 130) among a number of instruments used in Morocco.

One Arab surgeon gave me a hook (Pl. VII, *l*), which is inserted behind the roots for the extraction of particularly firm stumps, stating that it is more efficacious in such cases than the forceps. This man stated that he had endeavoured to check toothache by filling a cavity in the tooth with *opium*, but that this treatment had proved unsatisfactory. Indeed,

he appeared to be quite ignorant of the cause of toothache, although he is very widely known for his skill as a surgeon, particularly in trepanning. A layman informed me that the pain of toothache is caused by an 'insect' (doubtless he referred to the nerve) within the tooth, and that this insect can be killed by filling the cavity, should there be one in the tooth, with a mixture of *lime* and *pitch*, which will cause the tooth to cease from troubling or to break. *Gum asafoetida* is also used for the plugging of a hollow tooth.

The mouth is sometimes rinsed with *vinegar* in which a *viper's skin* has been steeped; or with an infusion, in *vinegar*, of *thyme* or of the fruit of *colocynth*; while the fresh-bruised leaves of *Marrubium supinum*, L., are chewed as a cure for toothache, as are those of the *wild olive*, the wild leaves being considered more efficacious for this purpose than those of the cultivated olive tree.

Sutures.

It appears that wounds, other than those in the face and the incisions made in lithotomy, are rarely sutured, the edges being merely drawn together by means of bandages torn from any old cotton material which may be at hand. When used, the sutures, of horse-hair, silk, or very rarely, of wire, are inserted in holes previously made with a needle (which in olden days was of silver) and tied separately. When the wound is healed they are cut and withdrawn.

Skin-Grafting

Is said by one surgeon to be sometimes practised in the hills and the desert, but neither he nor any other practitioner I have met with had ever attempted it.

Bullet Wounds.

The bullet is sought with the aid of probes, straight or spoon-shaped at one end (Pl. VIII, *h, j*), made in various lengths and thicknesses of iron, brass, or more often, of copper. Should the bullet have penetrated very far into the body it is often left in the wound, owing, I presume, to the surgeon's dread of interfering with the internal organs. In

other cases it is removed by means of a spoon-shaped probe or of long forceps (Pl. VIII, *o*), an incision being made with the knife, often used hot, to clear the way when necessary. Some surgeons dress the wound by inserting into it, with the aid of a probe, a rag steeped in *honey and alum*, leaving the rag in the wound, and renewing this dressing daily for five days, at the end of which time the wound should be ready to respond to a surface dressing.

Dressing is also carried into deep wounds upon strips of cotton threaded through holes, resembling large 'eyes' of needles, to be found in some probes (Pl. VIII, *j, u*); in this case the cotton is not left in the wound.

Other practitioners inject melted *butter* into the wound by means of a European syringe, which nearly all the surgeons now possess, the old-time native instrument having practically disappeared. This latter (Pl. VIII, *k*) consists of a tube of oleander wood, some six inches in length, narrow at one end, but extending to a 'bell mouth' at the other. The melted butter, or other liquid dressing, is inserted into the wide end of the tube to which the surgeon applies his lips, blowing the dressing into the open wound through the narrow end of the tube.

Butter or a mixture of *honey and butter* are commonly thus introduced into bullet wounds, a surface-dressing, which is considered particularly useful in these cases, being a mixture of *acetate of copper*, *sulphide of copper*, and *ammonium chloride* (all purchased in the large towns), powdered and boiled in *honey* to form a paste.

Bullet wounds, in which the projectile still remains, and from which, for any reason, no surgical operation is performed for its removal, are treated by the application of a little powdered *sulphide of arsenic*, which is intended to 'draw out the bullet'.

Dressings for Wounds.

A number of dusting powders are prepared by the Shawiya for application to cuts, such as :

- (a) The dried and powdered leaves of *Globularia alypum* ;
- (b) Dried and powdered leaves of *Tamarix gallica*, L., mixed in equal parts with *alum* ;

(c) Dried and powdered leaves of *Ajuga iva*, Schreb., mixed with a little *alum* ;

(d) Green leaves of *Marrubium supinum*, L., dried in the sun, powdered, and mixed with a little *alum* ;

(e) Dried and powdered leaves of *Erodium guttatum*, Willd. ;

(f) Five parts of the dried and powdered leaves of *Erodium malocoides*, l'Her., mixed with one part *alum* ;

(g) A dried and powdered plant of a species of *Artemisia* ;

(h) The dried and powdered leaves of *Teucrium polium*, L. ; or

(i) ancient books suggest the use as a dusting powder of the body of the larva of a beetle which is to be found upon the roots of *Thapsia garganica* ; and to destroy suppurating flesh around a wound the dried leaves of *Salvia clandestina*, L. (var. *angustifolia*) are applied in the form of powder.

As I have pointed out when describing the dressings used by surgeons, after operations, a mixture of *honey and butter* is most commonly employed, and these substances are frequently used in conjunction with other materials ; thus powdered leaves of *Erodium botrys*, L. (known to the Arabs as 'mother of the wound') are applied in *butter* or in *oil* ; or a little powdered *sulphide of arsenic* is sprinkled on the previously applied butter and honey ; or the powdered leaves of *Teucrium polium* are similarly employed ; or powdered seeds of *Peganum harmala* are sprinkled upon a coating of *butter* ; or the berries of *Juniperus phoenicea*, L., pounded to pulp, are mixed with *honey*, in the proportion of three parts pulp to one part honey, and half a table-spoonful of *pitch* from the same *Juniper* added to the mixture before application upon a pad of wool. Powdered leaves of the *fir* tree or powdered *blackberry* leaves are also sprinkled upon a coating of butter previously spread upon the seat of the injury.

A mixture of *pitch* and *pine gum* is used as a dressing for wounds : as is the *rotten bark* of *Juniperus oxycedrus*, powdered and mixed with *white of egg*, especially for cuts on the face ; or the powdered roots of *Rubia tinctorum*, also mixed with *white of egg* ; or powdered leaves and flowers of *Thy-*

melaea hirsuta, Endl. (*Passerina hirsuta*, L.) mixed with red or white *vinegar*; or the fresh leaves, bruised by pounding, of *Apium nodiflorum*, Reich.

For *Suppurating Wounds* fresh leaves of *Erodium malocoides*, l'Her., whose Arabic name implies 'sewing', for it 'sews up a wound', are applied to the injury; or powdered roots of *Pyrethrum* are applied in honey; or the roots of either *Narcissus tazetta*, L. (*Polyanthus narcissus*) or *Rubia tinctorum* are boiled in *milk* and used as a poultice; as is the powdered plant of *Artemisia herba alba*, similarly boiled in milk.

The following ointments are also used for suppurating wounds and sores:

(a) Six parts of the dregs of *red vinegar* boiled over a charcoal fire with six parts of *honey*, and mixed with one part of *acetate of copper*;

(b) One cupful of *olive oil* boiled up with a quarter of a cupful of fat from a *goat's kidney*, one-fifth of a cupful of *yellow candle grease*, one-sixth of a cupful of *acetate of copper* and a piece of *aloes* as large as a thimble, this ointment is especially useful in winter as it is 'hot';

(c) *Honey*, previously boiled up to 'clear' it, is heated until it simmers with equal parts of powdered *Malva sylvestris*, L., *ammonium chloride*, *saltpetre*, seeds of *Peganum harmala*, *sulphide of copper*, *cloves*, *lemon peel*, *acetate of copper*, and, a little only, *benjoin* and *red vinegar*; after this ointment has done its work of cleansing the wound, the following is applied to cause it to heal.

(d) *Honey* heated till it simmers with equal parts of *red vinegar*, *acetate of copper*, and *myrrh* and *aloes*.

PART III

MEDICINE

PURGES AND LAXATIVES. Some of the native doctors invariably commence a course of treatment by administering a purge, of which, as well as of laxatives, they possess a fair selection, the stronger varieties being :

(a) Forty grammes of the dried and powdered leaves of *Thymelea hirsuta*, Endl. (*Passerina hirsuta*, L.) are eaten in a dish of steamed semolina.

(b) Fragments of a clean root of *Thapsia garganica* are inserted into a piece of beef, which is then cooked in butter ; the pieces of root having been removed after cooking, the meat and the melted butter are consumed by the patient.

(c) Five grammes weight of the soft interior of the fruit of *colocynth* (not the seeds), when fully ripe, mixed with a coffee-spoonful of pure *honey* is eaten before breakfast.

(d) The seeds of *Euphorbia lathryis* (spurge) are given as follows by different practitioners : the heart of one or, if necessary, two seeds having been removed and thrown away—for they are poisonous—the rest of the seeds are swallowed in a mixture of rose-water and milk : a powdered seed, of which the outer skin or husk has been removed, is mixed with sugar and swallowed in the morning, half a seed only being administered to invalids and a smaller quantity to children ; one seed rolled in honey and swallowed in the morning, the patient subsequently partaking of hot soup, acts as an emetic as well as a purge.

(e) As much of the powdered seeds of *Peganum harmala* as can be placed upon a ten-centimes piece is eaten in *honey* in the morning, the patient lying down until the dose has had its effect.

(f) The powdered dried leaves of another *Euphorbia* (possibly *Guyoniana*) are taken in *honey*, four grammes of powder to half a coffee-spoonful of honey ; should this dose act too violently its effects can be stayed by swallowing *olive oil*.

(g) A quantity of *cinnabar* powdered and mixed in a litre of water or of milk is given as a purge, one coffee-cupful of the liquid constituting the dose.

Milder purges or laxatives are used in the form of an infusion in water of *Senna indica* or *alexandrina*, or of a mixture of water and the powdered *myrobalan* of commerce (*Terminalia chebula*), while an infusion of *Mentha rotundifolia*, L., or of the leaves of *Ecballium elaterium*, Rich. (squirting cucumber), are employed for the same purpose. The seeds or roots of the latter can also be used in addition to its leaves, the seeds producing the stronger and the roots the milder doses. As a corrective for the stomach of a suckling infant a very small quantity of the dried and powdered leaves of *Globularia alypum*, L. is administered in milk, while the stewed fresh leaves of the same plant, made into a kind of jam, are eaten by adults in daily doses of a coffee-cupful for fifteen days as a cure for a feeling of being generally 'out of sorts'.

COLIC AND INDIGESTION. A considerable number of the following remedies for colic and indigestion, such as *Artemisia herba alba* and *Cuminum cyminum*, L., appear to be known to most natives, and are not used only by medical practitioners.

For Colic an infusion in water of the flowers of :

(a) *Artemisia herba alba*, to which *sugar* has been added to counteract its bitterness, or of a whole plant of *Delphinium Balansae*, Boiss. et Reut., or of the powdered leaves of a local variety of *Thyme* are drunk ;

(b) A mixture of the seeds of *Negella sativa* and of *Cuminum cyminum* is powdered and taken in *honey*, the powdered seeds of the latter alone, mixed with *sugar*, being considered useful in cases of colic in infants.

(c) Half a coffee-spoonful of the powdered leaves of

Erodium malocoides, l'Her. swallowed in a soup-spoonful of honey is said to relieve immediately the pains of colic.

For indigestion.

(a) An infusion in water of *Artemisia absinthum* or of *Mentha rotundifolia*, L. is drunk, or

(b) The dried leaves of *Ajuga iva*, Schreb. are powdered and eaten in honey, or

(c) The extract obtained by pounding a whole plant of *Beta vulgaris*, L. is swallowed, or

(d) A kind of jam made by stewing the fruits of the cyprus tree is consumed; while for

FLATULENCE is recommended an infusion in water of either *Thyme* or *Artemisia herba alba* or *Ptychotis atlantica* (which latter is also swallowed when powdered in hot milk for sore throats and as an aid to urination); the water in which leaves of *Teucrium polium*, L. have been soaked without boiling is also given for flatulence, and the leaves of a herb closely resembling, both in appearance and in their scent, those of a small celery and which is stated at Kew to be a species of *Pimpinella* are eaten cooked with meat for the same complaint. For chill on the stomach a very small quantity of an infusion of the powdered leaves of *Thymé*, which has been bottled for storage, or a coffee-cupful of a similar infusion of the fresh leaves of *Rosemarinus officinalis*, L. or of *Artemisia herba alba* is swallowed daily for a few mornings before breakfast, the last-named infusion being also considered as valuable in cases of Worms, though the number of applications I have received for medicine for this complaint may indicate that, in reality, this very easily obtained remedy is not particularly efficacious.

For stomach troubles in general an extract obtained by heating the sliced-up roots of *Capparis spinosa*, L. (var. *rupestris*, Sibth.) in a dry receptacle over a fire is swallowed in water or in food.

AFFECTIONS OF THE LIVER AND SPLEEN, apparently very common among the Shawiya and the Arabs, are treated in one or other of the following manners:

(a) When the liver or the spleen is enlarged the symptoms observed are thirst, a yellow complexion, a bad taste in the mouth, a quick pulse, a distended feeling of the stomach,

and constipation. One of the purges noted having first been administered, equal parts of the powdered seeds of *Cuminum cyminum* and the dried and powdered roots of *Tamarix gallica* are mixed with *honey* in the proportion of one part powder to four parts honey, and one coffee-spoonful of this mixture is swallowed an hour before eating every morning and evening for, in severe cases, as long as one month, the patient meantime eating very little salt and no pepper or vegetables; he may, however, partake of butter, fresh milk, tea instead of coffee, barley semolina and roasted meat—the meat usually being consumed stewed in Algeria; he should avoid cold and exertion.

(b) The liver can be 'cleaned' by slowly masticating two and a half grammes of the seeds of *Foeniculum vulgare*, L. (common fennel) daily for fourteen days, while one soup-spoonful of the extract obtained by pounding fresh leaves of *Solanum nigrum* taken each morning, or a similar extract of the leaves of *Marrubium supinum*, L., drunk in warm water, may be used for the same purpose, and in cases in which 'the roots of the liver are not working' (to use my Shawiya informant's own phrase) the following treatment may be adopted:

(c) Bruise the roots of *Rubia tinctorum* (madder) and boil them in water, thus producing a red liquid; mix half a litre of this liquid with a similar quantity of an infusion of the roots of *Zizyphus lotus*, also a red fluid, and administer half a coffee-cupful daily before breakfast.

(d) Tie up in fine cotton material some *onions*, previously bruised in a mortar, and wring out their juice. Mix in a bottle one coffee-cupful of this extract with similar quantities of *olive oil* and *red* or *white vinegar*, the white variety for preference. Open very carefully an egg which has stood in clean water all night and pour its contents into a cup. Fill the empty egg-shell with the mixture from the bottle, and cause the patient to drink this dose and, immediately afterwards, to swallow the egg. This treatment, if carried out every morning before partaking of food or coffee, should effect a cure in six or seven days.

JAUNDICE is treated by administering daily before breakfast

one coffee-cupful of a mixture of one part of the dried and powdered leaves of *Capparis spinosa*, L. and five parts of *honey*, no vegetables, sour foods, nor spices being allowed to the patient during treatment; and the following quaint remedy for jaundice was also recommended by one of the most successful practitioners I met with.

He pounds the fruits of *Ecballium elaterium*, Rich. to extract their fluid; this he places in a bowl and allows it to settle, after which he bottles the clear fluid; throwing away the sediment at the bottom of the bowl. He causes the patient to lie upon his back, and then places one drop of the clear extract from the bottle into each of the patient's nostrils so that 'it runs into his head'. In five minutes a yellow foam-like discharge will exude from the patient's nose, and the jaundice, of which the symptoms are a yellow tint in the complexion and white of the eye, as well as irritability on the part of the sufferer, will be found to be cured at once. The seeds, leaves, or roots of the 'squirting cucumber' can be used as described (the first being the strongest and the roots the weakest), or fresh leaves of the plant may be inserted in the patient's nostrils.

Some doctors recommend bleeding on the crown of the head for jaundice, but my informant stated that the use of 'squirting cucumber' as described above is to be preferred. He also advised the washing of the patient in an infusion of *mint* (of which he recognizes four varieties in addition to *Mentha rotundifolia*, L.) in the treatment of this complaint.

FOR AFFECTIONS OF THE SPLEEN some doctors advise the swallowing of powdered *flint* in pills of *honey*, their suggestion being that the flint causes the honey to 'rise' as leaven causes dough to expand: this treatment should be carried out every morning for seven days. Another form of treatment for the same complaint consists in preparing an infusion of the fresh leaves and young shoots of *Tamarix gallica*, L. (only bushes growing in the desert at some distance from water should be employed), and boiling four parts of this infusion with one part of *vinegar*, in order that the two ingredients may mix well, the resulting mixture being drunk daily by the patient for seven days, and being, further, applied

as a lotion to his side over the spleen. A small quantity of *ginger* can be added to this mixture with advantage if it be obtainable.

A third remedy for affections of the spleen (those in which 'grains dans le rate' are a symptom) is to administer one part of the very bitter dried and powdered whole fruits of *Caparis spinosa*, L. (var. *rupestris*, Sibth.) mixed with four parts of *honey*, the dried and powdered leaves of the same plant being also used, but with a weaker effect. The fluid extracted by pounding a fresh plant of *Beta vulgaris*, L. is drunk for splenic troubles as well as for indigestion, while an infusion of the leaves of the male *Marrubium supinum*, having been strained, is swallowed for the same complaint, and the leaves, dried, and the small black seeds of *Ruta graveolens*, L. powdered and mixed in equal parts with *honey*, half a coffee-spoonful of the mixture being taken each morning, constitute yet another remedy for affections of the spleen.

DIARRHOEA. As a check to diarrhoea seeds of *Trigonella gladiata*, Stev. (fenugreek), *burnt iron*, *sugar*, and *wheat* are powdered and mixed in exactly equal parts, one coffee-spoonful of the mixture being swallowed, washed down with water : or *rice* is given in *milk* ; or powdered *gallnut* (of the oak) is taken in *milk* ; or a little *honey* is eaten each morning, the patient being allowed no water to drink, but partaking of an omelette of *eggs* and *butter* containing some powdered 'haklilt', a *dried milk* much used as a flavouring to foods in the Aures ; or the roots of the *oak* tree are boiled to obtain a red fluid which, when strained and re-boiled, will be found to be rather thick, and is administered daily, one coffee-spoonful before breakfast, instantly to check diarrhoea.

Two plants used in the treatment of liver complaints are also recommended for diarrhoea, namely *Foeniculum vulgare*, L., whose dried and powdered roots are mixed with *honey*, two parts of powder to three parts of *honey*, a coffee-spoonful of the mixture being swallowed daily for five days ; and *Zizyphus lotus*, Willd., whose dried fruits are powdered, and half a coffee-spoonful of the powder is consumed in the morning before breakfast in an *egg* cooked 'à la coq', but not very 'hard-boiled'.

CHOLERA appears not to be treated by the Shawiya doctors, its ravages, in common with those of other epidemics, being combated by withdrawing the population of the stricken village to the shelter of the high-lying pine-forests which are considered impregnable by the armies of 'jenun', or demons, which are believed to cause the outbreak, as I have explained in *Folklore* (vol. xxvi, pp. 245 and 246): an instance of the adoption of a very practical measure resulting from a magical idea.

For FEVER, which is common enough in the Aures and the desert, especially the variety which recurs every three days, I found remarkably few forms of treatment other than magical observances (such as the wearing of charms) or the use of *quinine*, which is now well known to the natives, and is obtained in tablet form in the large towns: one doctor, however, suggested that the drinking of an infusion of any of the five varieties of *mint* with which he is acquainted is useful in cases of fever, while for the headache resulting from such cases the patient should bathe the head in an infusion of the fresh leaves of either *Inula viscosa*, Ait., *vine*, *orange*, *walnut*, or *bottle gourd*, after which he should apply fresh leaves of any one of these to the head.

A layman in a desert oasis advised fumigation in the smoke of burning *date-stones* as a remedy for fever, and a sorceress, also from the desert, employs *Sesamum* for the same purpose and also a combination of *rue* and the seeds of *Peganum harmala*, substances much used in magic: besides which *hoopoe's feathers*, *black sheep's wool*, and *oleander leaves* are used for the fumigation of patients suffering from fever, a form of treatment which owing to its slight practical effect and its undoubted magical origin may perhaps bridge the almost negligible gap between primitive medical science and the art of magic.

COLDS IN THE HEAD are treated by causing the patient to inhale *steam* obtained by pouring water upon a hot hearth-stone, the inhalation taking place through an inverted half-grass funnel such as is used for filling goatskins; or the *smoke* of burning *sugar* and *walnut shells* together is also inhaled, care being taken to close the eyes, which may be

injured by the smoke arising from the sugar. An infusion of the seeds of *Cynoglossum pictum*, Ait. is drunk once daily, a small coffee-cupful constituting the dose, for five days ; while two other methods of treating a cold in the head consist in (a) eating a hot loaf of the ordinary flat unleavened *bread* of the country, which is folded over on itself and encloses some pounded *garlic* ; this should be eaten without partaking of any liquid, and the patient should forthwith go to bed and cover himself well with rugs, a cure resulting next day ; or (b) the swallowing of a raw *egg* upon which *pepper* has been sprinkled.

COUGHS AND CHEST AFFECTIONS. In the treatment of these we find that *Pyrethrum*, which, as we have seen, was found by Ebn el Beitar to be in use in Algeria before he introduced it to the scientific world of his day, is recommended by the doctors as well as by the ordinary natives of the Aures.

The roots of *Pyrethrum* are taken in soup ; or they are powdered and swallowed in *milk* at bedtime, the patient also retaining a piece of the root in his mouth so that he swallows the liquid from it ; or the powdered roots are eaten in cow's *butter* night and morning ; or an infusion of the roots is drunk at bedtime ; or equal parts of *Pyrethrum* root, *fenugreek* seeds, *Piper cubeba* and *musk*, powdered and mixed together are swallowed, one spoonful night and morning for seven days, during which time lemons may not be eaten.

In addition to the use of *Pyrethrum* a considerable number of other remedies are employed for the chest coughs to which the natives, owing perhaps to the cold winds blowing from the snow-capped peaks of the Aures while the sun is powerful in the lower valleys, appear to be particularly subject. Among them we have noted :

(a) An infusion of equal parts of the pounded leaves of *Sonchus maritimus* and *cinnamon*, to which a little *sugar* is added to counteract its bitterness ; dose, one tablespoonful night and morning.

(b) Roasted seeds of *Cuminum cyminum*, L. and *Negella sativa* powdered and mixed with *butter*, one year old ; dose, one coffee-spoonful night and morning.

(c) Pounded leaves of *Lavendula multifida*, L. eaten with *butter*, one year old.

(d) A soup made of *garlic* and grains of either *wheat* or *barley*, which must have been split in two, is eaten: the remedy being found in the garlic.

(e) The patient drinks *oil* instead of water.

(f) The berries of *Juniperus phoenicea*, L. are boiled thoroughly in water, left in the boiling pot all night, and the infusion strained and bottled. This infusion will keep good for several days in winter, but soon becomes sour in summer time. It is given, fresh, in doses of half a coffee-cupful night and morning for coughs.

(g) The powdered plant of *Peganum harmala* is eaten in the morning mixed with *honey*.

(h) An infusion of roots of mallow (*Malva sylvestris*, L.) which have been washed, scraped and cut into sections, is given, one coffee-cupful night and morning.

While for coughs in which difficulty of respiration or a shortness of breath are symptoms,

(i) One spoonful of an infusion of the dried leaves of *Pergularia tomentosa*, L. (*Daemia cordata* R. Br.) is swallowed night and morning for three days; women who are enceinte, however, may not take this; or

(j) the flowers of *Datura metel*, L., dried and broken up, are smoked in the form of a cigarette, or

(k) An infusion of the pounded leaves of *Rosemarinus officinalis*, L. is drunk.

For coughs in children.

(l) A very little of the powdered roots of *Pistacia atlantica*, Desf. (terebinthe) is swallowed in *oil*, or

(m) One soup-spoonful of a mixture of a species of *Lycoperdon* and *butter*, heated together, is eaten each morning.

For BRONCHITIS, a mixture of powdered *linseed* and *honey* had been recommended by a native doctor to a Jew who informed me that the treatment had proved very beneficial; while one doctor uses the following medicine for bronchitis, and has also found it to be efficacious in cases of gas poisoning resulting from the war. He boils the flowers of *violet* in an enamelled pot until they become 'white', when the flowers

are thrown away and the remaining water is thickened with *sugar* until it reaches the consistency of jam. The patient takes his supper at 5 p.m., and swallows a coffee-cupful of a mixture of a very little of this 'jam' and water at bedtime, and on rising in the morning for five days. Sometimes a poultice is applied for chest coughs, and this consists of powdered *colocynth*, *Lawsonia inermis* (henna), *Thapsia garganica*, and a little *red pepper* mixed in *honey*.

WHOOPING COUGH is usually treated by causing the patient to drink *asses' milk*, a remedy which is very highly esteemed by the natives, who claim that cures have been effected after only three or four bowls of the milk have been consumed.

HEADACHE. The dried and powdered leaves of either *Thymus munbyanus*, Boiss., *Ecballium elaterium*, Rich., *Ajuga iva*, Schreb., or *Mentha Rotundifolia*, L., are administered in the form of snuff for headache, which is also treated by bathing the head with an infusion of the fresh leaves of the first named or of the seeds of *Hyoscyamus albus*, L., both of which are regarded as soporifics; and powdered seeds of *Peganum harmala* and *cloves* mixed in *vinegar* are applied to the head encased in the outer skin of a *Barbary-fig* (cactus) leaf as a remedy for headaches, possibly on account of their magical value.

EARACHE. An infusion of the powdered leaves of *Thymus munbyanus*, strained through a cotton-rag before use, is introduced a drop at a time into the ear which is painful as a result of chill, as is a drop of the extract obtained by pounding fresh leaves of *Ajuga iva* mixed with *olive oil*; while the dried blood of a lizard, very common in the Sahara, *Uromastix acanthinurus*, also mixed with *olive oil*, is employed in the same way and is regarded as a remedy for deafness.

The fresh capsules of asphodel, *Asphodelus microcarpus*, are pricked, and the fluid they contain squeezed into the ear for earache, which is considered by one of the doctors I met with to be due to an affection of the side of the skull, and asphodel is further employed in the treatment of earache in conjunction with *olive oil*, a hole being made in the fresh root of the plant which, the hole having been filled with olive oil,

is heated and squeezed over the ear so that the oil and the moisture from the root may drop into it.

A remedy for earache in children is prepared by bottling flowers of rosemary, *Rosmarinus Tourneforti*, de Noe, in *oil of Sesamum*, and exposing them to the heat of the sun for forty days, at the end of which time the flowers are thrown away and the oil kept for introduction into the ear.

Two forms of treatment for earache, which are also applied to inflamed eyes, furnish us with additional examples of a combination of medical science and magic, namely, the application of a *viper's skin* boiled in *olive oil* and the introduction, by means of the gall-bladder of a jackal, into the eye or ear of an extract obtained by pounding leaves of the beet, *Beta vulgaris*, L.: for, as I have pointed out in *Folklore* (vol. xxvi, pp. 230 and 248), the viper, owing to its spiteful disposition, and a gall-bladder, on account of its bitterness, are highly distasteful to the demons, which, in the opinion of the Shawiya and the Arabs, are the cause of disease.

RHEUMATISM. As far as I, a layman, could judge, rheumatism appeared to be very prevalent among the Shawiya. The poultice alluded to as a remedy for chest affections, consisting of *colocynth*, *Lawsonia inermis*, *Thapsia garganica* and *red pepper* mixed in *honey*, is applied to the part affected: or a mixture of one part of powdered roots of *Thapsia garganica*, three parts of *honey* and a little powdered *sulphur*, heated together to cause them to mix well, is similarly applied, or a poultice of the extract obtained by pounding leaves of *Hyoscyamus albus*, L., wrung out in rag and mixed with *linseed* is used to ease rheumatic pain: as is another poultice made of the pounded leaves of *Solanum nigrum*, applied wrapped in rag.

A nomad practitioner recommended that the part affected by rheumatism should be bled or tattooed (tattoo is used in medical magic for the treatment of some diseases, especially of the eye); or that a heated root of *Thapsia garganica* should be applied to the part after the manner of applying cautery, or that a mixture of *olive oil* and *salt* should be used as a liniment, or some very sour *white vinegar* should be rubbed upon the seat of the pain.

SYPHILIS must, I think, rank among one of the more common of the diseases to which the natives of the Aures and the desert are subject, and it is well known to all the practitioners I have met with under the name of 'The Great Sickness'. The doctors unanimously declared that they could cure syphilis, but some of them referred to the necessity of repeating treatment should a patient again become infected, so that it may well be that reappearance of the disease in uncured cases is mistaken by the Shawiya for re-infection.

Although the forms of treatment suggested by the three best-known practitioners with whom I discussed the disease are in the main similar to one another, yet there are certain differences in them, so that I may with advantage describe the remedies recommended by each.

The first of these doctors states that he recognizes no less than ninety-nine symptoms of syphilis in its various stages, and that nearly all the sickness in the Aures is, in one way or another, attributable to it. It is noteworthy, perhaps, that the number ninety-nine appears to have a certain mystic significance in Algeria. The first symptom observed by this doctor, before the appearance of the primary chancre, is the hardening of a gland or, as he expressed it, 'vein', on the inner side of the arm just over the elbow-joint, which becomes as 'hard as a stone'. As a later symptom he recognizes 'swelling of the bones'. In treatment he takes the roots of *Sarsaparilla* and the seeds of *Lepidum sativum*, L., pounds them to powder, and mixes two parts of each of the resultant powders with one part of roasted *wheat flour*; this powder, being mixed with one pound of *honey*, is administered to the patient each morning and evening before meals for fifteen days, one coffee-spoonful constituting the dose, but, in mild cases, seven days of this treatment will suffice. This period of treatment is followed by fifteen days in which no drugs are given, but in which the patient is carefully dieted, no cooked meat other than roast mutton, no butter, no salt, and no pepper being allowed to him, while to quench his thirst he must partake of an infusion of *Sarsaparilla* instead of water; he may partake of olive oil should he wish to do so. All this time the patient must sit in a room alone and avoid

all excitement, and no filthy conversation must take place in his hearing. As an alternative to sarsaparilla this doctor recommends the leaves of *Globularia alypum* to be used instead of it; while an infusion of a whole plant of *Peganum harmala* can be taken as a beverage in place of the sarsaparilla referred to above.

The same practitioner also recommends two forms of fumigation for syphilis, one, in the steam of boiling roots of *Globularia alypum*, or, as an alternative, in the smoke from burning a substance, resembling saltpetre in appearance, which is produced by mixing the ashes of the salt-tasting leaves of *Atriplex halimus*, L. with a little water and allowing the mixture to dry.

A second doctor recommended the following forms of treatment. The seeds of *Peganum harmala* are collected during the summer and kept for four years, but for no longer, as they then commence to deteriorate in value. These seeds, which are said to be used for no less than seventy-three forms of treatment, are excellent for syphilis. A purge, preferably *castor-oil*, having been given at the outset, one pill consisting of a little of these seeds powdered and mixed with *honey* is swallowed night and morning for fifteen days, after which a cure is effected. The powdered seeds are said to be intoxicating like alcohol, and the seeds are so powerful that for woman's use they are soaked in water to reduce their strength, when they can be administered whole without being reduced to powder. In mild cases of the disease a little of the powdered seeds is daily placed beneath the patient's tongue. During treatment salt must be avoided, and tea (as opposed to coffee), and milk should be drunk.

As an alternative to the above treatment the same practitioner advises the daily consumption of one 'packet' of the powdered roots of 'salha' (the dried *Sarsaparilla* which is sold by native druggists in areas in which the fresh plant is unobtainable), mixed with one 'packet' of the powdered seeds of *Lepidum sativum*, L., and washed down with a draught of water, all the patient's food during treatment being cooked in an infusion made from dried and powdered 'salha' leaves, seeds of *Lepidum sativum*, not powdered, and roots of 'salha',

also *not* powdered. The patient may not partake of bread which contains any salt, nor of fruit, vegetables, coffee, beef, goat's flesh, nor butter-milk ; though fresh milk is allowed, as is tea. He must eat in solitude, and may not smoke. This diet is followed for forty days, at the end of which time a cure is effected, any re-infection (or return) of the complaint being treated in the same way. In the case of mild attacks half doses of the medicine are prescribed.

The same doctor also suggests the fumigation of syphilitic patients in the smoke of burning *cinnabar*, but he says the patients should hold some oil in their mouths during the fumigation as cinnabar contains mercury, and its fumes may loosen the teeth. As wash for primary chancres he uses a mixture in water of *sulphide of copper* and *antimony*, a substance much used by Algerian women to darken their eyebrows and eyelids. For syphilitic sores on the nose and face he uses a very quaintly prepared dusting powder. He catches a number of specimens of a cantharide beetle, which in April frequent the flowers of *Thapsia garganica* and the olive tree, and which Professor Poulton has identified as *Mylabris oleae*, Cast. var. *Rimosa* (a variety, I believe, which is uncommon in collections). He places these beetles in a bottle, carefully wiring down the cork, and buries the bottle for forty days in the summer in manure, preferably that of the horse. Nothing is bottled with the insects, but during their interment they decompose, leaving maggots among the debris of their bodies, which debris these maggots consume. The maggots are then collected and crushed to powder upon a white plate, and applied to syphilitic sores on the nose and face, which sores will heal after three or four daily applications. In the case of dry sores the powdered maggots may be retained in position by the admixture of a small quantity of cow's butter containing *no salt*. We shall find later on that these powdered maggots are put to another use in the treatment of Boils.

The third doctor who gave me careful details of the treatment of syphilis recognizes a quick pulse, inability to swallow easily, and 'pains all over' as symptoms of the disease ; some patients also displaying external sores. He takes a new

earthen bowl, and in it he prepares an infusion of a whole plant of *Globularia alypum*, L., cut into small pieces. All bread and steamed semolina, the usual native fare, eaten by the patient must be cooked in this infusion for thirty days, and no salt or condiment may be used in its preparation, so that should the patient desire to eat butter such butter must be fresh and contain no salt. He also prepares thirty small 'packets' of powdered 'salha' (the dried *Sarsaparilla* of local commerce), one packet being swallowed by the patient morning and evening for fifteen days, the only liquid refreshment allowed him during this period consisting of an infusion of fresh *Sarsaparilla* roots. After this treatment has been in progress for four days a little mercury, *Lawsonia inermis* (*henna* dried for sale), and *Ruta graveolens*, L., are wrapped in paper and thrown on the fire, the patient shrouding himself in his 'burnous', or hooded cloak, so as to expose his whole body to the smoke, but taking care to close his eyes, ears, nose, and mouth to which the fumes are injurious. The fumigation is carried out once daily, and the resulting cure is permanent.

This practitioner, like the other two, is of opinion that cleanliness of person and surroundings is of the utmost importance in the treatment of syphilis, and that the patient should be left quietly in a room apart where no disgusting talk can reach his ears.

GONORRHOEA, another very common complaint in the hills and the desert, is treated by one doctor by sprinkling dried and powdered *stinging nettles* mixed with *jasmine* powdered (purchased in the towns) around and upon the penis and scrotum at night, the patient being forbidden to ride or to have sexual intercourse; another causes the patient to drink, night and morning, one coffee-cupful of an infusion of the roots of a plant which is stated at Kew to be probably *Juncus maritimus*, Lam., the stem of which is not used; while a third practitioner, in the treatment of both sexes, advises the swallowing of a little of the powdered seeds of *Lepidum sativum*, L., followed by the drinking of an infusion of a species of *thyme*, pronounced by Dr. Church of Oxford to be probably *Thymus fontanesi*, var. *pallescens*, this form of treat-

ment constituting an aid to urination. Urination is also increased by means of either of the following medicines :

(a) One coffee-cupful of an infusion of the pounded leaves of *Rosemarinus officinalis*, L., drunk each morning before breakfast (this was advised for the male sex only) ;

(b) An infusion of a whole plant of *Delphinium Balansae*, Boiss. et Reut., taken internally ; or

(c) The extract obtained by pounding fresh leaves of a species of *Pimpinella*, resembling a small celery in appearance and scent, is mixed with a little water and swallowed, one tablespoonful before breakfast and at bedtime. Another aid to urination, said also to be valuable in the treatment of 'stone', consists in swallowing *olive oil* and a mixture of *honey* and the powdered fruits of the *ash tree* : olive oil being sometimes introduced into the penis by means of a French syringe for the same purpose.

STRICTURE, for which one surgeon stated that he could perform an operation, is treated by causing the patient to swallow half a coffee-cupful of a mixture consisting of one litre of pure *olive oil* and one franc's worth of *acetate of copper*, which dose may be repeated next day if necessary, and which is said to 'force' urination.

One doctor I met with suggested a mixture of the seeds of *stinging nettles* and *raisin pulp*, presumably swallowed, as a suitable remedy for stricture.

SWOLLEN TESTICLES are treated by the application of a hot poultice of *barley flour* and the pounded fresh leaves of *Hyoscyamus albus*, L. ; or by the daily consumption for seven days of a coffee-spoonful of an infusion of the leaves of *Ecballium elaterium*, Rich., swallowed with a cup of coffee : the seeds, leaves, or roots of this 'squirting cucumber' may be so used at will, the seeds being the strongest and the roots the least powerful.

HAEMORRHOIDS, when external, are sometimes surgically treated by passing through them a cow's sinew steeped in ointment, a needle being used to make way for the sinew, but several other remedies are employed, often by laymen, such as the application of the ashes of leaves of *Globularia alypum*, L., mixed with the ashes of the leaves of

Juniperus oxycedrus, L., in oil or water, or the eating of a coffee-spoonful of *honey* and *garlic*, which mixture is also applied to the anus, forms of treatment which are also used in cases of internal haemorrhoids.

One doctor advises the application of the fluid resulting from heating *yolk of egg* in a pot; or the fumigation of the anus in the smoke of a fruit of *colocynth* which has been cooked in cinders and sliced in half, upon which a little *salt* has been sprinkled.

Another pounds the interior of a *colocynth* fruit, mixes it with a few spoonfuls of *honey* to form an ointment, heats it and applies it on a pad of rag to the anus, where it should remain all night, the severe pain which this treatment is said to cause being alleviated by the application of melted *butter*, sheep's butter being universally regarded as the best for medicinal purposes.

An ointment also used in the treatment of haemorrhoids, but which is said to be very expensive for some reason which I am quite unable to fathom, is made of a mixture of *pine pitch*, *camphor*, *mint*, and *salt crystals*; possibly the salt used is of a kind which is not easily obtainable and, therefore, comparatively expensive.

Patients are sometimes made to eat *yolk of egg* fried until it becomes 'black as pitch', one spoonful being consumed daily, while a diet of oil, butter, and unleavened bread is followed to the exclusion of meat, dates, and vegetables. The 'cast' skin of a local *viper* is also eaten as a cure for haemorrhoids, being cut into small pieces, and made into a kind of cake with semolina.

SKIN DISEASES. A very remarkable proportion of the children of the Aures and of the desert, more especially the latter, suffer from a form of itch which produces scabs all over the head and consequent loss of hair.

A mixture of the ashes of *oleander leaves*, *gunpowder*, *sulphur*, and *honey* (fresh *butter*, with no salt in it, can take the place of the last named) is used as an ointment for this itch, or the fat of either of the two lizards, *Uromastrix acanthinurus*, or *Varanus griscus* is used as an ointment (the similarity between the Latin name of the latter and its Arabic designation,

'Waran', is remarkable); or the powdered roots of *Thapsia garganica* mixed by heating with *honey*, in the proportion of one part powder to three parts honey, to which a little *sulphur* is added, is also used as an ointment for itch and to remove warts; while another ointment for the same purpose is made of the ashes of *Artemisia herba alba* mixed with *olive* and *almond oil*. The *pitch* of *pine* is applied to the head for the same complaint, a pad being laid over it consisting of sheep's wool, which *must be dirty*. It is curious that the use of dirty wool, often cut from the hind quarters of the sheep, is insisted upon in various magical observances in Algeria and also for the cleansing and contraction of the vagina.

I have found two lotions in use in the treatment of itch, one consisting of two parts of the extract of pounded leaves of *Solanum nigrum*, L. (var. *villosum*, Lam.), mixed with one part of the *gall secretion* of a *cow*, which is also applied to pimples on the face; and the other of an infusion of the bruised leaves of *oleander*. An infusion of mint, *Mentha rotundifolia*, L., is taken internally for itch.

For small WHITE-HEADED PIMPLES the patient is fumigated in the smoke of a burning plant of *Deverra scoparia*, Coss; while 'Rue butter', a remedy for several complaints, is also applied to them, being made as follows. The leaves of *Ruta montana*, L., are boiled in water until the water becomes yellow, when the leaves are thrown away and the water strained. The water is then mixed in equal parts with *olive oil*, the mixture being boiled until only half the original quantity remains. It is then bottled and stored for subsequent use.

The milk-like sap from the stem of *Pergularia tomentosa*, L. (*Daemia cordata*, R. Br.), from which the Arabic name of the plant, *Halib ed daba* ('milk of the she-ass'), is derived, is considered to be injurious to healthy skin, but its application is recommended to 'eat away dead skin', by which scabs may, perhaps, be meant.

MELANODERMIA, which is found in Morocco and stated by Dr. Raynaud in his *Étude sur l'Hygiène et la Médecine au Maroc* (p. 146) to correspond with the 'melas' of Celsus, is not uncommon in the Aures and the Algerian Sahara. It is

treated by the application of a lotion formed of equal parts of *white vinegar* and the extract obtained by pounding the leaves of *Ruta graveolens*, L.

For the complaint in which the skin becomes white in patches and the blood also becomes white, to quote my native informant, a mixture of the extract of pounded fresh leaves of *Beta vulgaris*, L., and *almond oil* is recommended, but I have not yet discovered how or in what quantities it is administered.

BALDNESS is treated by the application of a lotion made by boiling a *viper's skin* in *olive oil*; or of a mixture of *olive oil* and the ashes of a green *lizard*, known to the Arabs as 'burrion', a specimen of which I have not yet obtained. A lotion to make the hair 'fine and red' is prepared by mixing an extract of the pounded leaves of *Beta vulgaris*, L., with powdered 'henna' (*Lawsonia inermis*).

BOILS are treated by causing the patient to drink a coffee-cupful of the extract obtained by pounding young leaves of *Genista spartioides*, Spach. (*Retama monosperma*, Boiss.), after which he is well wrapped up to induce perspiration; having freely perspired, he drinks hot mutton broth strongly spiced with red pepper. If in three days the boils have not disappeared they are regarded as syphilitic, and the patient fumigated. For small boils on the hands three and a quarter grammes weight of *viper's skin* is divided into three parts, and each part eaten enclosed in a *date*.

To large boils, which each consist of a number of smaller ones and which tend to spread, an ointment is applied made by mixing *cedar pitch* with ashes of the root of the 'globe thistle', *Echinops spinosus*, L., the outer skin of the root having first been scraped away.

In order to cause boils to burst and to draw out the pus which they contain a fresh leaf of *Cynoglossum pictum*, Ait., is bound upon the part; or half of a fruit of *colocynth*, which has been heated over a fire, is similarly bound, the bitterness of it being noticeable in the patient's mouth as it is applied; or a poultice consisting of a dried *fig*, heated and besprinkled with a little *olive oil*, is used for the same purpose; the last two forms of treatment being recommended for 'Biskra

Button' as well as for ordinary boils. A dusting powder consisting of the dried leaves of *Pergularia tomentosa*, L. (*Daemia cordata*, R. Br.), finely powdered is applied daily for two or three days to boils which spread upon the arms and legs; while for those which appear upon the arms and thighs and give off a watery discharge the part affected is bathed with a mixture of *sulphide of copper*, after which some powdered maggots of the *Mylabris* beetle, already referred to in the treatment of syphilis, are applied as a dusting powder. In three or four days a cure is effected by this treatment.

ABSCESSSES, under which heading I have included the affection described to me as a 'painful swelling', are treated by means of various poultices, such as the dried plant of *Sonchus maritimus*, L., mixed with *milk* and *flour* which, applied tepid, causes the swelling to disappear without breaking; or the pounded green leaves of *Plantago major*, L., mixed with an equal quantity of powdered *beans* upon which a few drops of *vinegar* is sprinkled: a mixture, in *honey*, of *colocynth*, *Lawsonia inermis*, *Thapsia garganica* (all powdered) and a little *red pepper*: or dried and powdered leaves of *Thymelaea hirsuta*, Endl. (*Passerina hirsuta*, L.), boiled in *milk* or *vinegar*; or fresh leaves of *Hyoscyamus albus*, L., pounded in a clean mortar, and applied hot, in *barley flour*, the last two forms of treatment being especially recommended for causing the abscesses to break.

Should the surgeon find it necessary to open a swelling containing pus he uses powdered *flint* as a dusting powder. Upon painful swellings in general the powdered fruits of the *cyprus* are sprinkled.

AFFECTIONS OF THE MOUTH. For receding gums the patient bites the fresh root of *Eryngium campestre*, L., and applies the bitten end to his gums; for gums which are sore or ulcerated the mouth is rinsed with an infusion of *olive leaves* in two coffee-cupfuls of water in which ten grammes of *alum* have been dissolved; while for the soreness of the tongue resulting from an excessive use of tobacco *olive leaves* are chewed and retained in the mouth all night; or a solution of *alum* in water is used to rinse the mouth.

DROPSY is sometimes treated by the introduction of 'setons'.

One doctor, however, recommends the drinking, morning and evening, of a tablespoonful of water in which the roots of *Zizyphus lotus*, Willd., have been soaked all night; this dose acting as a thirst quencher and a slight aperient; or, as an alternative, he suggests one tablespoonful, taken morning and evening, of a mixture of water and the extract from pounded green leaves of a species of *Pimpinella*; or an infusion of the leaves of *Rosemarinus officinalis*, L.; while another doctor advised the external application to the abdomen of an extract from the pounded leaves of *Nasturtium officinale*, R. Br., after the patient has taken a bath, this treatment being intended to disperse the 'water in the stomach'.

As a thirst quencher an infusion of *Cynodon dactylon*, L., is recommended to those suffering from the above complaint and also to mothers, who should not partake of too much liquid.

SMALL-POX is regarded as most serious, and its result is believed to be in the hands of God alone; the only treatment for the disease I have yet found is identical with that suggested for *Measles*, and consists in attaching the bladder of a freshly killed lamb or goat to the patient's head so that the urine it contains can touch his head, but not flow away (this is said to restore consciousness in extreme cases), the patient being made to eat *honey* every day.

But inoculation against small-pox is known, and is carried out by applying a little pus from a sore of an infected person to three scratches between the forefinger and thumb of the person to be inoculated, a method similar to one described as existing in Arabia by Burckhardt in his *Notes on the Bedouins and Wahábys* (London, 1831, vol. i, p. 91). This inoculation, however, can only take place during an outbreak of the disease, for the Shawiya have no means of storing the necessary pus for future use.

Inoculation is also practised in the following manner for illness caused by the bite of certain spiders. A yellow insect, resembling a bee, frequents the *Thapsia garganica* plant in the spring, especially in the stony desert to the south of El Qantara. This insect is caught and placed in a white bottle

of boiled water, in which it is exposed to the full blaze of the summer sun for from thirty to forty days, when it will be found to have fermented; the part affected by the bite of the spider is then scratched, and a little liquid from the bottle introduced into the scratches after the manner of vaccination; the patient taking a purge and drinking tea.

These spiders are said to deposit liquid near to the eye of their victim, the tissues round the eye becoming much swollen, the liquid referred to above is used to bathe such swellings, but must not touch the eyeball itself or blindness will result. Of this bee-like insect I have not yet secured a specimen; it is said, in life, to pursue and kill the dangerous spiders when it finds them upon the *Thapsia* plant.

OBSTETRIC MEDICINE. Accouchement is usually easy among the Shawiya and the Arabs, the doctor being rarely called in, although as we have seen, occasionally an operation is performed for the removal of a dead child. To ascertain whether or no a woman is *enceinte* the red liquid resulting from boiling pounded roots of madder (*Rubia tinctorum*) is given to her to drink, and if the subsequent urine is red she is pronounced not to be pregnant, while should the urine be 'white' she is considered to be *enceinte*.

It may be that madder is believed to induce menstruation, a suggestion which we shall find to be supported when we examine Shawiya methods of preventing conception.

It is bad for a woman to drink more than a very little water at the time her child is born, the illness resulting from immoderate consumption of water being treated in one of the three following ways:

(a) *Eggs* are made into an omelette and powdered stems of a plant which, according to Leclerc's translation of Abderrezzaq, appears to be *Thapsia villosa*, are sprinkled upon them, the patient eating such an omelette every morning for three days; or

(b) A flat loaf of unleavened bread in the preparation of which *stale goat's fat* has been liberally used, is eaten, and the patient allowed to walk a little, after which she may drink a large quantity of water; or

(c) A plant of *Capparis spinosa*, L., is boiled in oil, which

the patient drinks each morning for three days when a cure will result.

When the child is badly placed and delivery accordingly impeded a mixture of powdered *carrot seeds*, the body of the beetle, *Mylabris oleae*, var. *Rimosa*, and a plant of *Euphorbia* is placed in hot water and allowed to cool. When cold one coffee-cupful of the mixture is swallowed, and within five minutes the child will be born. There is no loss of consciousness on the part of the patient, but, in the words of the doctor who described this treatment to me, the mixture 'forces the child to be born'.

In cases of malformation in a woman which render delivery impossible, conception is prevented or abortion caused by the doctor, and doubtless in other cases as well, though many old women can be found to assist an erring friend in this respect by magical and other practices without summoning medical aid. A root of madder (*Rubia tinctorum*, L.) is scraped clean and a piece of it about two-thirds of an inch in length is inserted into the vagina and causes menstruation to recommence even if it has not occurred for three months, a treatment the success of which is absolutely guaranteed by my Shawiya informant.

Conception is also prevented by fumigating the vagina in the smoke of burning *sulphur*; or by swallowing *castor-oil* seeds which have been dipped in the warm blood of a freshly killed *rabbit*, conception being prevented for one year for each seed so swallowed; or *foam* from the mouth of a male camel in the 'rutting' season is consumed in water for the same purpose.

EXCESSIVE MENSTRUATION is checked by swallowing an infusion of *blackberry seeds*; or a coffee-spoonful of a powder consisting of *fenugreek seeds* (*Trigonella gladiata*, Stev.), *burnt iron*, *sugar* and *wheat*, mixed in exactly equal parts.

APHRODISIACS of a magical nature are very commonly employed in Algeria, and I have described some of them in the *Journal* of the Royal Anthropological Institute (vol. xliii) and in *Folklore* (vol. xxvi).

The eating of *nuts* and *honey* before breakfast is a very usual course followed by men to attain increased sexual

virility: while the consumption of a *sheep's testicles* cooked with *olive oil, garlic, butter, and honey* is also recommended for the same purpose: as is the eating of *goat's flesh* stewed with powdered leaves of *Ajuga iva*, the patient previously steaming his genital organs in the vapours arising from the dish as it stews. *Pyrethrum* is also employed as an aphrodisiac, twenty-five grammes of its powdered roots being heated with half a pound of *honey* which, when cold, is rolled into pills the size of a bean; one pill being swallowed in the morning for fifteen days, and one in the evening, when sexual virility will be required.

RABIES is very common in the dogs which are to be found in every Algerian hut or tent; and to prevent hydrophobia resulting from the bite of an animal suffering from it the victim eats three little lumps, each as big as a grain of wheat, of the powder obtained from the maggots of the decaying beetle *Mylabris oleae*, var. *Rimosa*, which, as we have seen, is used in the treatment of syphilis, the three lumps being enclosed in a date, and the dose taken once daily. In order to ascertain if hydrophobia will result from a bite, the victim bites off a piece of bread and offers it to a dog, if the dog accepts it hydrophobia will not result, but should it refuse the morsel the victim knows that he is infected, for the dogs have a power of detecting the presence of the disease.

Other means of preventing hydrophobia consist in causing the patient to eat a little of the dried leaves of *Ajuga iva*, Schreb., in *honey* (a little only, as too much will cause colic), or a little of the extract of a pounded fresh plant of *Genista spartioides*, Spach. (*Retama monosperma*, Boiss.), is swallowed in a cupful of water daily for seven days, some doctors recommending its use for three days only, and stating that it acts as a vomitive.

INFLAMMATION OF A VEIN. The following treatments were recommended by two practitioners for acute pain in a vein in the leg which would appear to be caused by inflammation of the internal saphenus vein: five grammes weight of the pulp of *colocynth* is eaten in a coffee-spoonful of pure *honey*, a purge which cleanses the bad blood that causes the pain; or a walnut shell, split in half, is attached to the leg about four inches

above the ankle, and acts as a receptacle to hold in place some *Clematis flammula*, L., which will cause an abscess (or, perhaps, ulcer) to appear and to 'run' for ten days, after which a cure results. The natives say that this abscess or ulcer, which is very deep, is the cause of the pain along the course of the vein. The rubbing of the leg with *ostrich fat* is also suggested for this complaint.

SUNSTROKE is said to be immediately cured by applying to the head a mixture of *barley flour*, pounded *onions*, and a little *vinegar*, which is the only remedy I have found for a complaint that does not seem to be so frequent as might be supposed under the Saharan sun.

MUMPS are treated by the external application of powdered roots of *Lycium europaeum*, L., cooked in *milk* or *vinegar*; or of the ointment known as *Rue Butter* which, prepared as already described, is used for sores, backache, pimples, and ear-ache.

Before concluding my notes on Shawiya materia medica with a list of dressings for sores, &c., I may mention one remedy which, upon the authority of Daud el Antaky, one doctor informed me was a panacea for all ills which afflict the human body from the chest to the head inclusive, namely powdered seeds of *Peganum harmala* mixed with hot water and *oil of poppies* drunk sweetened with *sugar*.

We have noted the use of *Peganum harmala* for several complaints, but, in the opinion of my informant, it is valuable for all ills of the parts of the human body mentioned.

RUNNING SORES are treated by the application of a fresh leaf of *Cynoglossum pictum*, Ait., or by sprinkling the ashes of a whole dried plant of *Anabasis articulata*, Mog., upon a coating of butter placed upon the sore to retain the ashes in position: or by washing the sore with an infusion of the fresh leaves of *Anabasis articulata*: or by the application of fresh pounded leaves of the *peach tree*.

I once witnessed the following treatment of sores, not deep ones, upon the outer side of both legs above the ankles of a man about fifty years of age. The doctor applied melted *butter*, sheep's or cow's butter serving equally well, to the sore on the right leg, sprinkled some powdered *litharge* upon

it and, having covered it with a pad of wool, bandaged it up. The left leg was first washed with soap and then treated in the same way save that a layer of squashed *dates*, as thick as a pancake, was bound to the part in place of the pad of wool. The doctor left some powdered *gallnut* to be daily applied in *honey* and *butter* by the patient's wife. Legs of children which are rendered sore by urination are sprinkled with the powdered *under-bark of pine*.

BURNS AND SCALDS are both treated alike, the *white* of a raw *egg* is applied to the injured part and roots of the *thistle* are chewed in the mouth and the juice thus extracted is also applied, as it is to blisters which have been pricked.

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Butter, 32, 37, 38, 42, 47, 61, 62, 65, 66, 73, 75, 76, 84, 91-3.
- Camel fat, 50.
— flesh, 55.
— foam, 90.
Camphor, M, 84.
Candle grease, M, 67.
Cantharides, M, 59.
Castor oil, M, 80, 90.
Capparis spinosa, 70, 72, 73, 89.
Carrot, seeds, 90.
Cedar, 23.
Cinnabar, M, 69, 81.
Cinnamon, M, 75.
Clematis flammula, 92.
Cloves, M, 67, 77.
- Colocynth, 25, 64, 68, 78, 84, 86, 87, 91.
Copper, acetate, M, 18, 55, 57, 65, 67, 83.
—, sulphide, M, 28, 65, 67, 81, 87.
Coral, M, 17, 54.
Cotton, M, 56.
Cow, gall, 85.
Cuminum cyminum, 69, 71, 75.
Cynodon dactylon, 88.
Cynoglossum pictum, 75, 86, 92.
Cyprus, 70, 87.
- Date, 47, 74, 86, 93.
Datura metel, 76.
Delphinium Balansae, 69, 83.
Deverra scoparia, 85.
Dung, cow, 48.
—, goat, 28, 61.
—, mule, 49.
- Earth, 17, 28.
Ecballium elaterium, 69, 72, 77, 83.
Echinops spinosus, 86.
Egg, chicken's, 46, 53, 55, 66, 71, 73, 75, 84, 89, 93.
—, ostrich, M, 54, 55.
Erodium botrys, 66.
Erodium guttatum, 66.
Erodium malcooides, 66, 67, 70.
Eryngium campestre, 87.
Euphorbia, 69, 90.
Euphorbia lathrys, 68.
- Fenugreek, *see* *Trigonella*.
Fig, 86.
Fir, 66.
Flint, 72, 87.
Flour, 37, 42, 46, 87.
Foeniculum vulgare, 71, 73.
- Gallnut, oak, M, 28, 47, 73, 93.
Garlic, 75, 76, 84, 91.
Gazelle, gall, 55.

- Genista spartioides*, 86, 91.
 Ginger, M, 73.
 Goat, fat, 62, 89.
 —, kidney, 67.
 Gunpowder, M, 84.

 Hair, human, 55.
 Honey, 37, 47, 57, 59, 65-73, 76-80, 83-5, 87, 88, 91, 93.
Hyoscyamus albus, 29, 77, 78, 83, 87.

Inula viscosa, 74.
 Iron, burnt, M, 55, 73, 90.

 Jackal, gall, 55.
 Jasmine, M, 82.
Juncus maritimus, 82.
 Juniper, 23.
Juniperus oxycedrus, 66, 84.
 — *phoenicea*, 28, 32, 40, 58, 61, 66, 76.

Lavendula multifida, 76.
Lawsonia inermis (henna), 58, 77, 78, 82, 86, 87.
 Lemon-peel, 67.
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 Lime, M, 64.
 Linseed, M, 47, 76, 78.
 Litharge, M, 92.
 Lizard, green, 86.
 —, *uromastrix*, 25, 29, 63, 77, 84.
 —, *varanus*, 17, 63, 84.
Lycium europaeum, 53, 92.
Lycoperdon, 76.

Malva sylvestris, 47, 67, 76.
Marrubium supinum, 55, 64, 66, 71, 73.
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Mentha rotundifolia, 59, 63, 69, 70, 72, 77, 85.
 Mercury, M, 82.
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 —, asses', 77.
 —, dried, 73.
 —, woman's, 55.
 Mint, 72, 74, 84.
 Musk, M, 75.
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 Myrobalan, M, 18, 69.
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Narcissus tazetta, 67.
Nasturtium officinale, 88.
Negella sativa, 69, 75.

 Oak, roots, 73.
 Oleander, 74, 84, 85.
 Olive, leaves, 64, 87.
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 Onions, 71, 92.
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 Ostrich, fat, 92.

 Peach, leaves, 92.
 Pearls, M, 54.
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 Pepper, red, 17, 75, 77, 78.
Pergularia tomentosa, 76, 85, 87.
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Piper longum, M, 55.
Pistacia atlantica, 76.
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 Poppy, oil, M, 92.
Ptychotis atlantica, 70.
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 Quince, 56.
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Teucrium polium, 38, 66, 70.
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Thapsia villosa, 89.
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Thymus Fontanesi, 82.
Thymus munbyanus, 77.
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